SPECTRUM®

Miscellaneous Applications

CABLETRON SYSTEMS

The Complete Networking Solution™

Summary of Changes

Version	Date	Reason/Rational	Nature of Changes
E 1	3/16/98	Update for 5.0	Change structure of Application View Reference doc set

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Contents

Chapter 1 FDDI Application

FDDI Views 1-2
FDDI Station List View 1-3
FDDI App Views 1-4
SMT Device Configuration View 1-5

Chapter 2 PPP Application

PPP Application Protocols 2-1
Control Protocols 2-1
Network Protocols 2-2
Network Control Protocols (NCPs) 2-2
PPP Application Views 2-2
PPP LCP Application Configuration View 2-4
PPP Link Status Configuration View -
Local to Remote Configuration Table 2-6
PPP Link Status Configuration Table View -
Remote to Local Configuration View 2-8
PPP Link Status Table View 2-9

Chapter 3 DS1 Application

DS1 Views 3-1
DS1 Configuration Table View 3-2
DS1 Configuration View 3-3
DS1 Fractional Table Config View 3-7

Chapter 4 RS-232 Application

RS-232 Views 4-2
RS232 Port Table View 4-2
RS232 Port Table Configuration View 4-3
RS232 Port Input Signals Table View 4-4
RS232 Port Output Signals Table View 4-5
RS232 Synchronous Views 4-6
RS232 Synchronous Port Table View 4-6
Synchronous Port Detail View 4-7
RS232 Asynchronous Views 4-8
RS232 Asynchronous Port Table View 4-8
RS232 Asynchronous Port Detail View 4-10

Chapter 5 WAN Application

WAN Views 5-1
WAN Connection Table View 5-2
WAN Connection Physical Ports View 5-3
WAN Connection Interface Table View 5-4

Chapter 6 Frame Relay Application

Frame Relay Views 6-1
Virtual Circuit Table View 6-2
Virtual Circuit Error Table View 6-4
Interface Dlcmi Table View 6-5

Chapter 7 Token Ring Application

Token Ring Views 7-1
Token Ring Detail View 7-2
Token Ring IF Views 7-3
Token Ring IF Configuration View 7-4

Chapter 8 DLSw Application

DLSw Views 8-1
Information View 8-2
DLS Participating Routers View 8-4
Station View 8-4
Local SNA Frame Filter View 8-6
Local NetBIOS Filter View 8-7
Remote SNA Frame Filter View 8-7
Remote NetBIOS Filter View 8-8
SNA Default Destination View 8-8
NetBIOS Default Destination View 8-9
Circuit Diagnostic View 8-9
Poll and Status View 8-10
Circuit Data Transfer View 8-12

Chapter 9 APPN Application

APPN Views 9-1
APPN Information View 9-3
Network Node View 9-5
End Node View 9-6
SNMP Information View 9-6
Memory & XID Information View 9-7
Link Station & Port Information View 9-9
Node Port View 9-10
Node Port IP View 9-12
Node Port DLS View 9-12
Node Port Token Ring View 9-13

Node Port DLC Trace View 9-13
Node Link Station View 9-15
Node Link Station IP View 9-20
Node Link Station DLS View 9-21
Node Link Station TokenRing View 9-22
APPN Node Link Status/Error View 9-23
APPN Global Topology View 9-25
Node Topology Tables View 9-29
Topology Route View 9-30
Adjacent Node View 9-31
Topology Node View 9-32
Transmission Group Topology Node View 9-33
Flow Reduction Sequence Number Topology Node View 9-36
Transmission Group FRSN Topology Node View 9-37
Class of Service Tables View 9-40
Class of Service Mode View 9-41
Class of Service Name View 9-41
Class of Service Node Row View 9-42
Class of Service Transmission Group Row View 9-43
Directory Performance View 9-46
Directory View 9-48
APPN Local Topology Information View 9-49
Local End Node View 9-52
Local End Node Transmission Group Node View 9-52
Local Transmission Group Topology 9-54
APPN Session Views 9-57
APPN Session Information View 9-58

Chapter 10 ATM Client Application

ATM Client Application Views 10-1
Virtual Channel Link Table View 10-4

Chapter 11 Fast Ethernet Application

Fast Ethernet Application Views 11-1
Fast Ethernet Port Table View 11-2

Index

Figures

Chapter 1 FDDI Application

Figure 1-1. FDDI Station List View 1-2
Figure 1-2. SMT Device Configuration View 1-4

Chapter 2 PPP Application

Figure 2-1. PPP LCP Application Configuration View 2-3
Figure 2-2. Local to Remote Configuration Table. 2-5
Figure 2-3. Remote to Local Configuration Table 2-7
Figure 2-4. PPP Link Status Configuration View 2-9

Chapter 3 DS1 Application

Figure 3-1. DSI Configuration Table View 3-2

Chapter 4 RS-232 Application

Figure 4-1. RS232 Port Table View 4-2
Figure 4-2. RS232 Synchronous Port Table View 4-6
Figure 4-3. RS232 Asynchronous Port Table View 4-8

Chapter 5 WAN Application

Figure 5-1. WAN Connection Table 5-2

Chapter 6 Frame Relay Application

Figure 6-1. Frame Relay Virtual Circuit Table View 6-2
Figure 6-2. Frame Relay Virtual Circuit Error Table View 6-4
Figure 6-3. Frame Relay Interface DLCMI Table View 6-5

Chapter 9 APPN Application

Figure 9-1. APPN Information View 9-2
Figure 9-2. APPN Global Topology View 9-25
Figure 9-3. Class of Service Tables View 9-40
Figure 9-4. APPN Directory Performance View 9-46
Figure 9-5. APPN Local Topology Information View 9-49
Figure 9-6. APPN Session Information View 9-57

Chapter 10 ATM Client Application

Figure 10-1. ATM Client Virtual Channel Link View 10-3

Chapter 11 Fast Ethernet Application

Figure 11-1. Fast Ethernet Port Table View 11-2

Chapter 1

FDDI Application

FDDI provides speed and reliability to a LAN and is often used as a backbone technology as well as a means of connecting high-speed computers in a local area. This chapter describes the views available for the FDDI application.

ANSI developed the Fiber Data Distributed Interface (FDDI) as a standard for fiber-optic data transmission. FDDI is a token-passing ring architecture that operates at 100 Mbps. In addition to its transmission speed, other advantages of FDDI include the inherent noise immunity of fiber optics, higher bandwidth, and longer transmission distance. Transmission by fiber also increases security as fiber does not emit electrical signals that can be tapped. Unlike Ethernet (and, to a certain extent, Token Ring), the FDDI network standard is fault tolerant by design due to a dual counter rotating ring and optical bypass switches.

FDDI defines the use of two types of fiber: single mode and multimode. Single-mode fiber allows only one beam of light to travel through the fiber, while multimode allows multiple beams. Single-mode fiber generally uses lasers to generate the light, while multimode fiber uses light-emitting diodes (LEDs).

SMT, Station Management, is required to provide the control necessary at the station level to manage the processes underway in the various FDDI layers and to ensure that the station works cooperatively with other stations on the ring. SMT provides many services, such as:

- Connection Management
- Station Insertion and Removal
- Configuration Management
- Fault Isolation and Recovery
- Ring Scheduling
- Station Connection Statistics

There are two FDDI Applications:

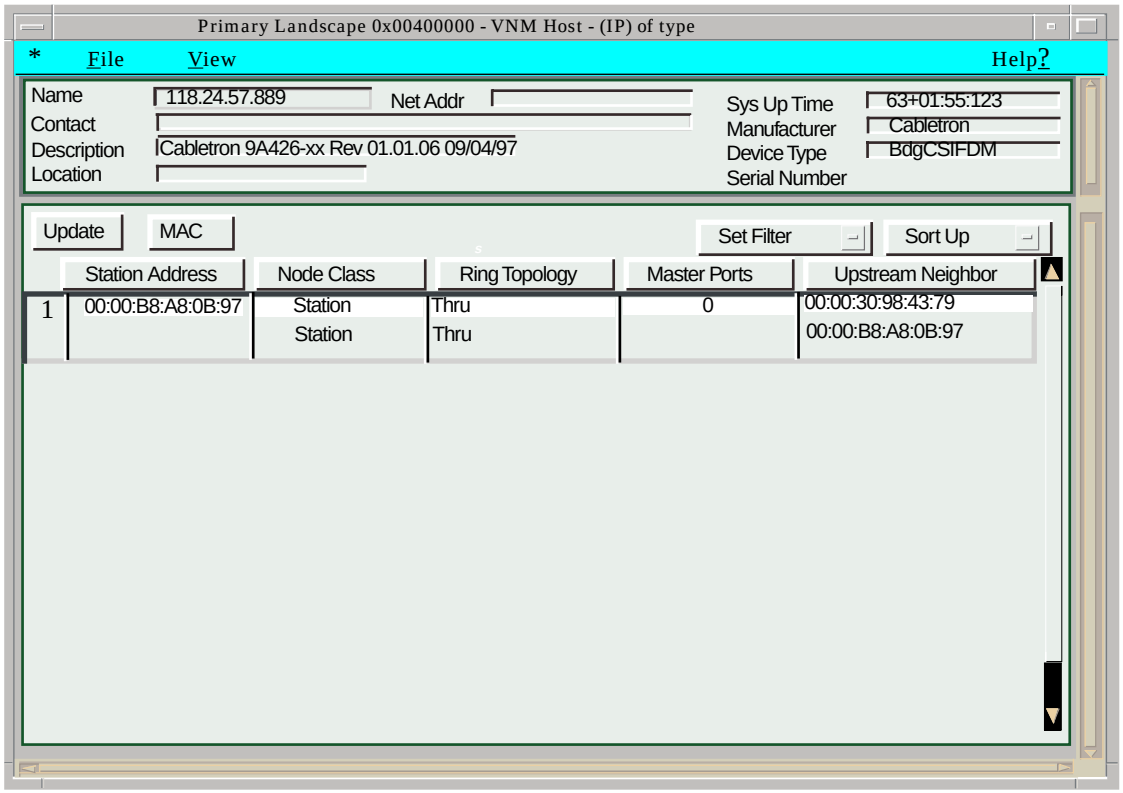
- FddiSMT
- FDDI App (RFC 1512App)

FDDI Views

There is one application-specific subview available for the FDDI application from the FddiSMT Icon Subviews menu, the FDDI Station List View.

The FDDI Station List View, shown in Figure 1-1, displays the configuration of the FDDI ring and basic information about the devices in the ring.

Figure 1-1. FDDI Station List View


Primary Landscape 0x00400000 - VNM Host - (IP) of type
* File View Help?
Name 118.24.57.889 Net Addr
Contact
Description Cabletron 9A426-xx Rev 01.01.06 09/04/97
Location
Sys Up Time 63+01:55:123
Manufacturer Cabletron
Device Type BdgCSIFDM
Serial Number
Update MAC Set Filter Sort Up
Station Address Node Class Ring Topology Master Ports Upstream Neighbor
1 00:00:B8:A8:0B:97 Station Thru 0 00:00:30:98:43:79
Station Thru 00:00:B8:A8:0B:97

FDDI Station List View

This view displays the configuration of the FDDI ring.

To access: Select **Station List** from the FddiSMT Icon Subviews Menu.

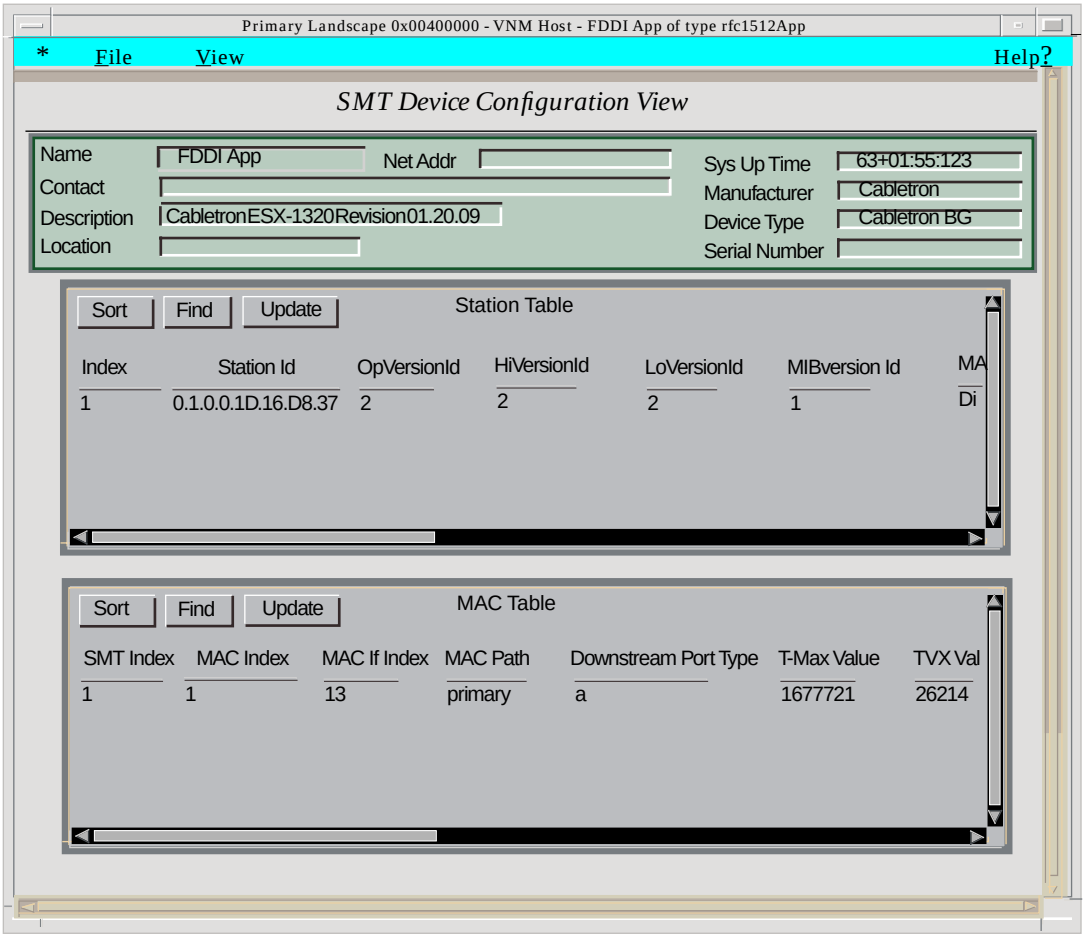
Station Address	The address of the ring node. You select canonical or MAC presentation.
Node Class	The type of FDDI ring device. Types of Node Classes are: Station - An FDDI node capable of receiving, transmitting, and repeating data. Concentrator - An FDDI node that provides attachment points for stations that are not directly connected to the FDDI ring.
Ring Topology	The current state of this FDDI node.
Master Ports	The number of master ports on this node. Values range from 0 to 255.
Upstream Neighbor	The canonical or MAC address of the last node to receive the token before this node. SMT Rev 6.2 and earlier will specify an unknown address as 00.00.00.00.00.00. SMT revisions after 6.2 will specify an unknown address as 00.00.F8.00.00.00.
Update	Click on this button to update the table.
MAC/Canonical	Click on this button to toggle the display of station addresses between MAC (Physical) and Canonical (Ethernet). The button displays the format NOT currently selected.
Set Filter	Click on this button to set a filter affecting the stations displayed in the table. Choices are Set Filter and Clear Filter. Select an attribute to filter against by clicking one of the column heading buttons.
Sort Up/	Click on this button to sort the stations displayed in the table. Choices are Sort Up, Sort Down, and Un-Sort. To select an attribute to sort by, click one of the column heading buttons.

FDDI App Views

There is one application-specific subview available for the FDDI App application from the RFC1512App Icon Subviews menu, the SMT Device Configuration View.

The SMT Device Configuration View is shown in Figure 1-2.

Figure 1-2. SMT Device Configuration View



SMT Device Configuration View

This view provides two tables displaying FDDI information. The Station Table and the MAC Table. Both tables have double-click zones to access subviews that allow selected entries to be modified.

To access:	Select **Configuration** from the Icon Subviews menu or double-click on the text label of the FDDI App Application View icon.
Station Table	This table provides a list of the SMT entries. Double-clicking on any entry in the Station Table accesses a Station Table View, which allows you to modify the selected entry. The Station Table and its corresponding entry-specific views provide the information described below. (Note that you must scroll the Station Table window in order to see all table entries.)
Index	A unique integer identifier for each SMT. The value for each SMT must remain constant at least from one re-initialization of the entity's network management system to the next re-initialization.
Station Id	The unique identifier for an FDDI station.
OpVersionId	The SMT version that this station is using for its operation. The version number is included in the SMT frame so that a receiving station can determine whether or not its SMT version is able to communicate with the SMT version of another station. Knowing the version number allows the stations to handle version mismatches. Each FDDI station supports a range of SMT versions.
HiVersionId	The highest version of SMT that this station supports. If a received frame has a version higher than the HiVersionId, the frame is discarded.
LoVersionId	The lowest version of SMT that this station supports. If a received frame has a version lower than the LoVersionId, the frame is discarded.
MIB VersionId	The SMT version of the FDDI MIB of this station.
MAC Cts	The number of Media Access Control (MAC) entities present in this station or concentrator, indicating the number of ring port pairs.

SMT Device Configuration View (Continued)

Non Master Cts	The number of A, B, or S ports on this station or concentrator.
Master Cts	The number of M Ports in a node. If the node is not a concentrator, the value of the variable is zero. An M port is a port that provides a connection for Single Attachment Station (SAS) devices to the FDDI framework.
Notify	The timer, in seconds, used in the Neighbor Notification protocol. This value can range from 2 to 30 seconds, with a default value of 30 seconds. You can modify this field.
StatRptPolicy	Indicates whether the node will generate Status Reporting Frames for its implemented events and conditions. Choices are True or False. If True, Status Reporting Frames will be generated. The initial value is True.
TraceMaxExpiration	The maximum propagation time, in milliseconds, for a Trace on an FDDI topology. You can modify this field.
Bypass Present	Indicates whether the station has a bypass on its AB port pair. Possible options are True (bypassing) or False (not bypassing).
ECM State	Indicates the current state of the Entity Coordination Management (ECM), which controls the optical bypass switch and notifies physical connection management when an acceptable connection has been made and the transmission medium is available. The possible ECM states defined below are Out, In, Trace, Leave, Path_Test, Insert, Check, Deinsert.
Out	When Connection Management (CMT) is initialized, the ECM enters the Out state. In this state, the ECM waits for a connect request from SMT. A successful completion of a path test is required to proceed out of the Out state. In the Out state, if an optical bypass switch is present, it is in a bypassed state.
In	The normal state for a completed connection.
Trace	Used to localize a stuck Beacon condition.

SMT Device Configuration View (Continued)

Leave	Used to allow sufficient time to break any existing connections.
Path_Test	Used upon the completion of the Trace function. In this state, the station or concentrator performs a test of its entities and data paths.
Insert	Allows for the switching time of the optical bypass switch. In this state, an insert request is sent to the optical bypass switch. The ECM state remains as Insert until the optical bypass switch has completed switching.
Check	Used to confirm that both the primary and secondary optical bypass switches have switched.
Deinsert	Allows time for the optical bypass switch to deinsert.
CF State	The attachment configuration for the station or concentrator. There are thirteen possible states. These are defined below.
Isolated	The port is not inserted into any path.
Local_a	The A port is inserted into a local path and the B port is not.
Local_b	The B port is inserted into a local path and the A port is not.
Local_ab	Both the A and B ports are inserted into a local path.
Wrap_a	The secondary path is wrapped to the A port.
Wrap_b	The primary path is wrapped to the B port.
C_wrap_a	The primary path and secondary paths are joined internal to the node and wrapped to the A port.
C_wrap_b	The primary path and the secondary paths are joined internal to the node and wrapped to the B port.

SMT Device Configuration View (Continued)

Wrap_ab	The primary path is wrapped to the B port and the secondary path is wrapped to the A port.
Thru	The primary path enters the A port and emerges from the B port. The secondary path enters the B port and emerges from the A port.
Local_s	The S port is inserted into a local path.
Wrap_s	The primary path is wrapped to the S port.
C_wrap_s	The primary path and secondary paths are joined internal to the node and wrapped to the S port.
Remote Disconnect	Indicates whether the station was remotely disconnected from the network as a result of receiving a Station Action disconnect in a Parameter Management Frame. A station requires a Connect Action to rejoin and clear the flag. This field displays True when the station has been disconnected, and False when the station has not been disconnected.
Station Status	The current status of the primary and secondary paths within this station. Options are Concatenated, Separated, or Thru.
Peer Wrap	A configuration management flag indicating that the port has peer wrapped. Options are True or False. Peer wrap is a condition which occurs when a dual-attachment node is wrapped with a Peer mode connection.
Time Stamp	A time variable to allow rate calculations from counter values. This value may be reset on power change, station self-test, or path-test.
TransitionTimeStamp	This variable reflects the time of the most recent event occurrence, condition assertion, or condition deassertion in the station. It is updated by storing the value of TimeStamp.
Station Action	Within an entry-specific view, this button allows you to initiate action on the station. The action options defined below are Other, Connect, Disconnect, Path-Test, Self-Test, Disable-a, Disable-b, Disable-m.. The default is Other.
Other	Results in an appropriate error.

SMT Device Configuration View (Continued)

Connect	Generates a Connect signal to ECM to begin a connection sequence.
Disconnect	Generates a Disconnect signal to ECM.
Path-Test	Initiates a station Path_Test.
Self-Test	Initiates a station Self_Test.
Disable-a	Disables the A port if the A port mode is peer.
Disable-b	Disables the B port if the B port mode is peer.
Disable-m	Disables all M ports.
MAC Table	This table provides a list of the MAC entries. Double-clicking on any entry in the MAC Table accesses a MAC Table View, which allows you to modify the selected entry. The MAC Table and its corresponding entry-specific views provide the information described below. (Note that you must scroll the MAC Table window in order to see all entries.)
SMT Index	The value of the SMT index associated with this MAC.
MAC Index	The index variable for uniquely identifying this MAC.
MAC If Index	The interface index number corresponding to this MAC. If none is applicable, the MAC If Index value is zero.
MAC Path	Indicates which FDDI ring the device's MAC is currently attached to. The MAC Path options are Isolated, Local, Secondary, Primary, Concatenated and Thru. These are defined below.
Isolated	The MAC has no connection to the ring or other concentrator ports.
Local	The MAC is connected to one or more nodes but is not connected to the dual ring.

SMT Device Configuration View (Continued)

Secondary	Indicates that the secondary FDDI ring is being used.
Primary	Indicates that the primary FDDI ring is being used.
Concatenated	Indicates the port is inserted in both the primary and secondary paths in a concatenated wrap configuration.
Thru	Indicates that the port is inserted in both the primary path and secondary paths in a thru configuration.
Downstream Port Type	The type of the first port that is downstream from this MAC (the exit port). Possible types are A, B, S, M, or None.
T-Max Value	The maximum supported value of Token Rotation Timer (TRT), displayed in nanoseconds. T_Max is the length of time that an unsuccessful claim process persists before a MAC on the ring begins to beacon.
TVX Value	The Valid Transmission Timer (TVX) passed to the MAC, displayed in nanoseconds. This is reset whenever a valid transmission is received. In the event that TVX expires on a particular station, that station will start the ring recovery process.
Frames Received	The number of frames received by this MAC.
Frames Copied	The number of frames addressed to and successfully copied into the station's receive buffers by this MAC. Note that this count does not include MAC frames.
Frames Transmitted	The number of frames transmitted by this MAC. Note that this count does not include MAC frames.
Errors	The number of frames that were detected in error by this MAC that had not been detected in error by another MAC.
Format Errors	The number of instances in which this MAC detected a format error during frame reception such that the frame was stripped.

SMT Device Configuration View (Continued)

Threshold	A threshold which, when exceeded, causes the generation of a MAC Condition report. Stations not supporting variable thresholds will have a value of 0. This field can be modified.
RMT State	The current state of the Ring Management (RMT) State Machine. The possible states are Ring-Op, Isolated, Non-Op, Detect, Non-Op-Dup, Ring-Op-Dup, Directed, and Trace. These states are defined below.
Ring-Op	The ring is functioning normally.
Isolated	The device is not attached to the main ring through its A and B ports.
Non-Op	The device is attempting to enter the ring.
Detect	The claim (beacon) process of the FDDI ring protocol has exceeded one second; there may be a problem on the ring. In this state, the ring is still alive, but no data is being transmitted.
Non-Op-Dup	The ring is not operational; a duplicate MAC address may have been discovered during the ring initialization process. This state is unlikely to occur unless you are using locally administered addresses, as factory-set MAC addresses are guaranteed to be unique.
Ring-Op-Dup	The ring is operational; however, a duplicate address has been detected. Like Non-Op-Dup, this state is unlikely to occur unless you are using locally-administered addresses.
Directed	The beacon process did not complete within 7 seconds. The device is sending directed beacons to notify the other stations that a serious problem exists on the ring, and a Trace state is soon to follow.
Trace	A problem exists on the ring that could not be corrected during the beaconing process, and a Trace has been initiated. During a Trace, the device sends a signal that forces its nearest upstream neighbor to remove from the ring and conduct a self-test.

SMT Device Configuration View (Continued)

Dup Address	Indicates the current status of the duplicate address detection function. None indicates the duplicate address test has not been completed. Pass indicates the duplicate address test has completed and has not detected a duplicate address. Fail indicates the duplicate address test has completed and has detected a duplicate address. This complements the duplicate address detection function of RMT, which operates when the logical ring is not operational.
Hardware Present	This variable indicates the presence of underlying hardware support for this MAC object. Possible entries are True or False.

Chapter 2

PPP Application

The Point-to-Point Protocol (PPP) Application provides a method for transmitting datagrams over serial point-to-point links. This chapter provides access information for the PPP Application views and describes the view fields available for the PPP application.

The Point-to-Point Protocol (PPP) consists of a large family of complex protocols.

PPP Application Protocols

The PPP protocols may be divided into three categories, described below.

Control Protocols

The Control Protocols are used to control the operation of the PPP. The Control Protocols include the Link Control Protocol (LCP), the Password Authentication Protocol (PAP), the Link Quality Report (LQR), and the Challenge Handshake Authentication Protocol (CHAP).

Network Protocols

The Network Protocols are used to move the network traffic over the PPP interface. A Network Protocol encapsulates the datagrams of a specific higher-layer protocol that is using the PPP as a data link. Note that within the context of PPP, the term “Network Protocol” does not imply an OSI Layer-3 protocol; for instance, there is a Bridging network protocol.

Network Control Protocols (NCPs)

The NCPs are used to control the operation of the Network Protocols. Generally, each Network Protocol has its own Network.

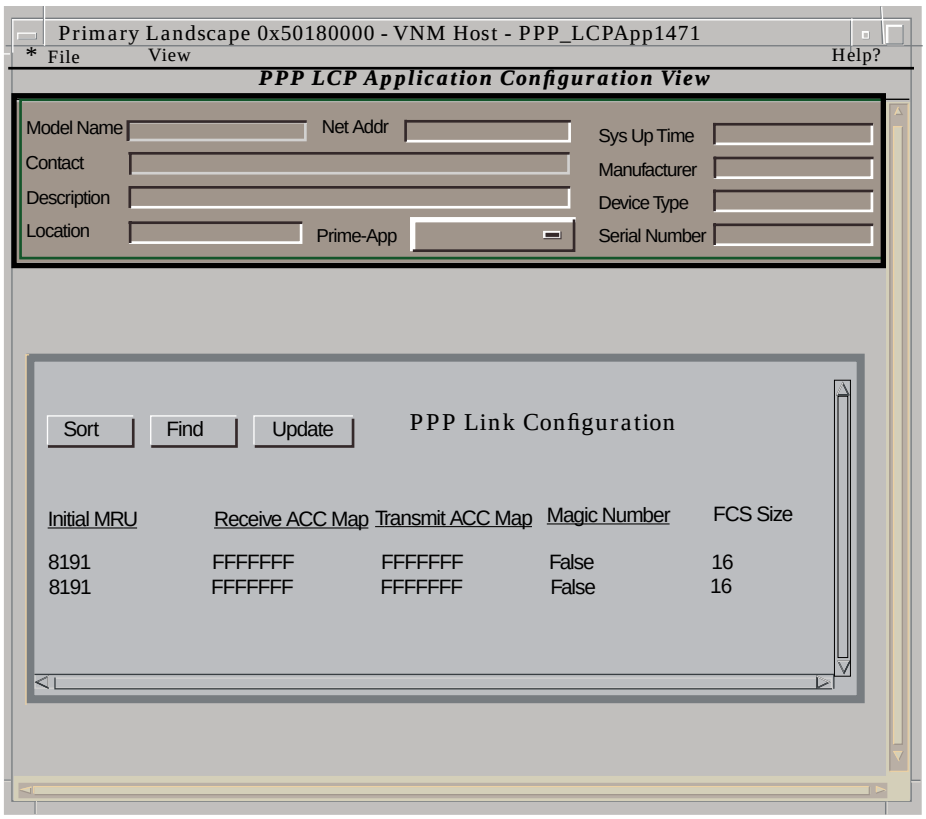
PPP Application Views

Four PPP application-specific views exist within SPECTRUM. The following information can be obtained from the PPP_LCPApp1471 App Icon Subviews menu:

Icon Subviews Menu Choice	PPP Application View Accessed	Table Accessed
Configuration	PPP LCP Application Configuration Table	PPP Link Configuration
Local to Remote Configuration	PPP Link Status Configuration Table	Local to Remote Configuration
Remote to Local Configuration	PPP Link Status Configuration Table	Remote to Local Configuration
Link Status Table	PPP Link Status Configuration Table	Link Status

Figure 2-1 shows the PPP LCP Application Configuration View.

Figure 2-1. PPP LCP Application Configuration View



PPP LCP Application Configuration View

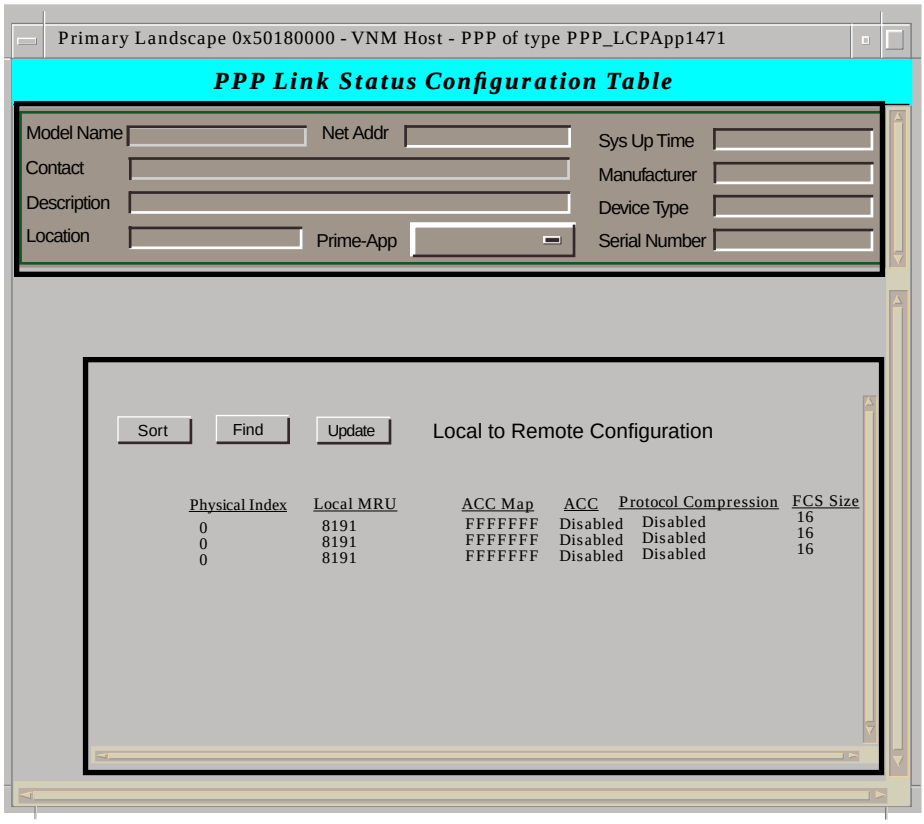
The PPP LCP Application Configuration View identifies the LCP (Link Control Protocol) configuration parameters for this PPP Link. These variables represent the initial configuration of the PPP Link. The actual values of the parameters may be changed when the link is brought up via the LCP options negotiation mechanism. Double-clicking on an entry in the PPP Link Configuration Table brings up the PPP LCP Application Configuration View. This view allows you to modify field values. You can update, sort, or search the table for specific information.

To access: Select **Configuration** from the Icon Subviews menu.

Interface Index	The unique value assigned to identify the interface on that WAN connection. This field is not available in the ETWMIM.
Initial MRU	The initial Maximum Receive Unit (MRU) that the local PPP device advertises to the remote device.
Receive ACC Map	The Asynchronous-Control-Character-Map (ACC) that the local PPP device requires for use on its receive side.
Transmit ACC Map	The Asynchronous-Control-Character-Map (ACC) that the local PPP device requires for use on its transmit side.
Magic Number	Indicates whether the local PPP Entity will attempt to perform Magic Number Negotiation with the remote node. Possible entries are: true (attempts negotiation), and false (negotiation is not attempted).
FCS Size	The size of the Frame Check Sequence (FCS), in bits, the local device attempts to negotiate for use with the remote device.

Figure 2-2 shows the PPP Link Status Configuration View, with remote to local configuration information.

Figure 2-2. Local to Remote Configuration Table.



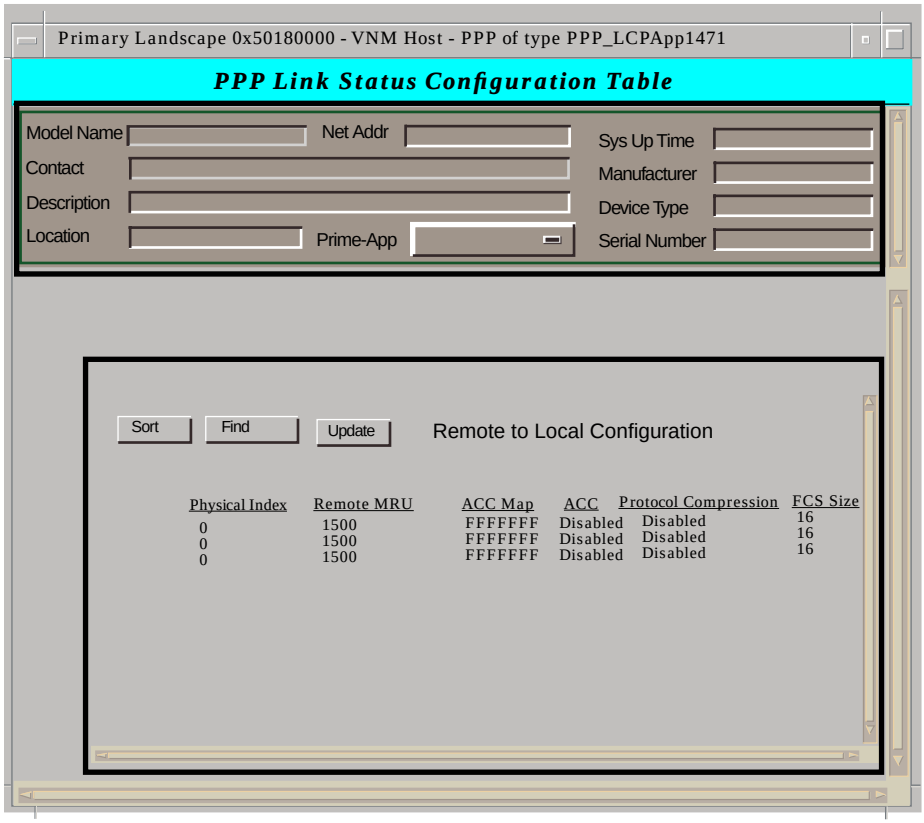
PPP Link Status Configuration View - Local to Remote Configuration Table

The PPP protocol indicates whether the local PPP entity will use Protocol Compression when transmitting packets to the remote PPP entity. The value of this object is meaningful only when the link has reached the open state. This view allows you to update, sort, or search the table for specific information.

To access:	Select **Local to Remote Configuration** from the Icon Subviews menu.
Physical Index	The unique value assigned to identify the low-level interface over which this PPP Link is operating. This interface would usually be an HDLC or RS-232 type of interface. If there is no other element that can be identified, then the value of this object is 0. For example, if PPP operates over a serial port there will be two entries in the Table. The PPP could be running over 'interface' number 123 and the serial port could be running over 'interface' number 987. Therefore, ifSpecific.123 would contain the object ID PPP. ETWMIM - refers to this field as PPP Link.
IF Index	A unique value for each PPP Link. The value must remain constant from one re-initialization of the system to the next. ETWMIM - refers to this field as PPP Link.
Local MRU	The initial Maximum Receive Unit (MRU) that the remote PPP entity will advertise to the local entity. If this value is set to 0, no MRU is advertised and the default MRU is assumed. Changes are enabled upon the next link restart.
ACC Map	The Asynchronous Control Character (ACC) Map that the remote PPP entity requires for use on the receive side of the link. Changes are enabled upon the next link restart.
ACC	The Asynchronous Control Character (ACC) Map that the remote PPP entity requires for use on the transmit side of the link. Changes are enabled upon the next link restart.
Protocol Compression	Indicates if the remote PPP entity will use Address and Control Compression when transmitting packets to the remote PPP entity.
FCS Size	This field displays size, in bits, of FCS (Frame Check Sequence) the remote node will generate when sending packets to the local entity.

Figure 2-3 shows the PPP Link Status Configuration View, with remote to local configuration information.

Figure 2-3. Remote to Local Configuration Table



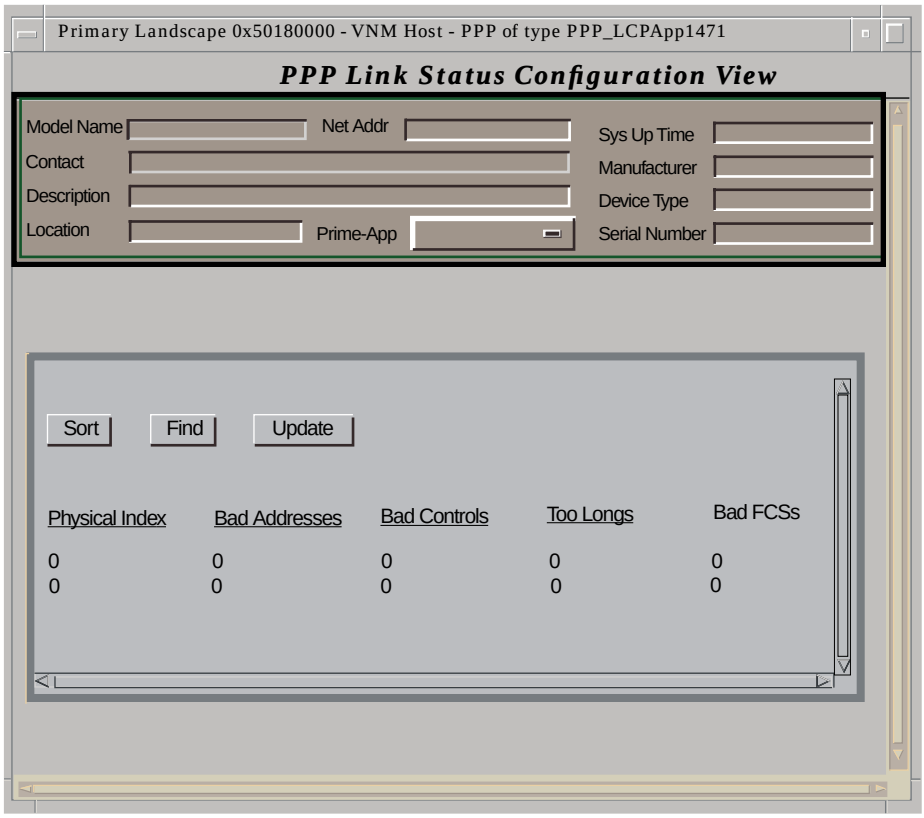
PPP Link Status Configuration Table View - Remote to Local Configuration View

The PPP protocol indicates whether the remote PPP entity will use Protocol Compression when transmitting packets to the local PPP entity. The value of this object is meaningful only when the link has reached the open state. This view allows you to update, sort, or search the table for specific information.

To access:	Select **Remote to Local Configuration** from the Icon Subviews menu.
Physical Index	The unique value assigned to identify the low-level interface over which this PPP Link is operating. This interface would usually be an HDLC or Rs-232 type of interface. If there is no other element that can be identified, then the value of this object is 0. For example, if PPP operates over a serial port there will be two entries in the Table. The PPP could be running over 'interface' number 123 and the serial port could be running over 'interface' number 987. Therefore, ifSpecific.123 would contain the object ID PPP. ETWMIM refers to this field as PPP Link.
IF Index	A unique value for each PPP Link. The value remains constant from one re-initialization of the network management system to the next. ETWMIM refers to this field as PPP Link.
Remote MRU	The initial Maximum Receive Unit (MRU) that the local PPP entity will advertise to the remote entity. If this value is set to 0, no MRU is advertised and the default MRU is assumed. Changes are enabled upon the next link restart.
ACC Map	The Asynchronous Control Character (ACC) Map that the local PPP entity requires for use on the receive side of the link. Changes are enabled upon the next link restart.
ACC	The Asynchronous Control Character (ACC) Map that the local PPP entity requires for use on the transmit side of the link. Changes are enabled upon the next link restart.
Protocol Compression	This field indicates whether the local PPP entity will use Address and Control Compression when transmitting packets to the remote PPP entity.
FCS Size	This field displays the size, in bits, of FCS (Frame Check Sequence) that the local node will generate when sending packets to the remote entity.

Figure 2-4 shows the PPP Link Status Configuration View.

Figure 2-4. PPP Link Status Configuration View



PPP Link Status Table View

Double-clicking on an entry in this table brings up the PPP Link Status Performance View that includes a pie chart breakdown of the items listed in the table. Fields from both views are identified and described below. This view allows you to update, sort, or search the table for specific information.

To access: Select **Link Status Table** from the Icon Subviews menu.

IF Index	The unique identifier as it relates to the port (interface); n/a for the ETWMIM.

PPP Link Status Table View (Continued)

Physical Index	The unique value assigned to identify the low-level interface over which this PPP Link is operating. This interface would usually be an HDLC or Rs-232 type of interface. If there is no other element that can be identified, then the value of this object is 0. For example, if PPP operates over a serial port there will be two entries in the Table. The PPP could be running over 'interface' number 123 and the serial port could be running over 'interface' number 987. Therefore, ifSpecific.123 would contain the object ID PPP.
Bad Addresses	This value indicates the number of addresses that do not follow a legal format.
Bad Controls	This value indicates the number of illegitimate controls used.
Packet Too Longs	This value indicates the number of oversized packets, or giants. ETWMIM refers to this field as Too Longs.
Bad FCSs	This value indicates the number of illegal Frame Check Sequence (FCS) that occurred during transmission. This often refers to extra characters added to a frame for error control purposes.
Total	Indicates the total number of errors received regarding link status with the device; n/a for ETWMIM.

Chapter 3

DS1 Application

DS1 is a high-speed baseband transmission link. This chapter provides access information to the DS1 Application views.

DS1, or *Digital Signal 1*, operates at 1.544-Mbps (Megabits per second) over a packet-switched datagram delivery service known as Switched Multimegabit Data Service (SMDS). This delivery service is designed for high speed wide-area data communications. SMDS is usually described as a fiber-based service, but DS1 access can be provided over either copper-based media or fiber. The DS1 application field descriptions are provided in this chapter.

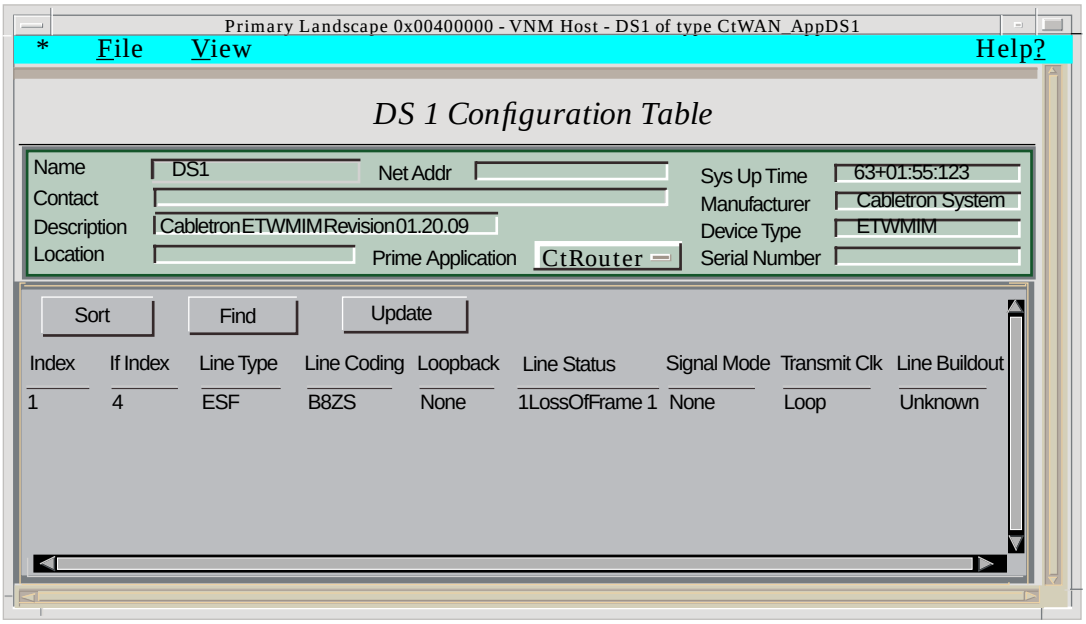
CtWANAppDS1, the Cabletron proprietary MIB for the DS1 application, references RFC 1406 which, in turn, has replaced in its entirety RFC 1232.

DS1 Views

There is one application-specific subview available for the CtWANAppDS1 application icon, the DS1 Configuration Table View.

The DS1 Configuration Table View is shown in Figure 3-1 below. Further subviews are opened by double-clicking table entries.

Figure 3-1. DSI Configuration Table View



DS1 Configuration Table View

You can update, sort, or search the table for specific information. Double-clicking on a table entry opens the DS1 Configuration View, which provides the same information as the DS1 Configuration Table for the selected interface and allows you to modify field values.

To access: Select DS1 **Configuration Table** from the CtWANAppDS1 Icon Subviews menu.

DS1 Configuration View

The DS1 Configuration View provides the same information as the DS1 Configuration Table for the selected interface and allows you to modify field values.

To access: Double-click on a DS1 Configuration Table entry to access the DS1 Configuration View.

Index	This field displays the index value which uniquely identifies the CSU (a single DS1 physical interface) to which the entry is applicable.
If Index	This field displays the index value uniquely identifying an interface to a DS1.
Line Type	This field displays the type of DS1 line implementing this circuit. The type of circuit affects the number of bits per second the circuit can reasonably carry, as well as the interpretation of the usage and error statistics. The values in sequence describe: Other - A line type other than those listed below. ESF - AT&T Extended SuperFrame format DS1. D4 - AT&T D4 format DS1. (Supported by MicroMMAC.) E1 - CCITT recommendation G.704. (section 2.1.3.2) E1-CRC - CCITT recommendation G.704. (section 2.1.3.1) E1-MF - G.704 (Table 4a) with TS16 multiframing enabled. E1-CRC-MF - G.704 (Table 4b) with TS16 multiframing enabled.

DS1 Configuration View (Continued)

Line Coding	This field displays the type of Zero Code Suppression used on the link, which in turn affects a number of its characteristics. Possible Zero Coding options are: JBZS - Refers to the Jammed Bit Zero Encoding, in which the AT&T specification of at least one bit every 8 periods is literally implemented by forcing a pulse in bit 8 of each channel. B8ZS - Refers to the use of a specified pattern of normal bits and bipolar violations, which are used to replace a sequence of 8 zero bits. HDB3 - Used by G.704 links with or without CRC. ZBTSI - Zero Byte Time Slot Interchange. Used by ANSI to clear channels. AMI - Refers to a mode wherein no zero code suppression is present and line encoding does not solve the problem directly. In this application, the higher layer must provide data which meets or exceeds the pulse density requirements, such as inverting HDLC data. Other - A line coding other than those listed above.
DS1 Identifier	This field identifies the channel.
Transmit Clock	This field displays the source of the Transmit Clock. Possible Transmit Clock sources are: Loop - Indicates that the recovered receive clock is used as the transmit clock. Local - Indicates that the local clock source is used. Through - Indicates that the recovered receive clock from another interface is used as the transmit clock.
Loopback Config	This field displays the loopback configuration of the DS1 interface. The values mean: NoLoop - Not in the loopback state. PayloadLoop - The received signal at this interface is looped through the device. Typically the received signal is looped back for retransmission after it has passed through the device's framing function. LineLoop - The received signal at this interface does not go through the device (minimum penetration) but is looped back out. OtherLoop - Loopbacks that are not defined here.

DS1 Configuration View (Continued)

Signal Mode	This field displays the signal mode of the interface. Possible signal modes are: None - Indicates that no bits are reserved for signaling on this channel. RobbedBit - Indicates that T1 Robbed Bit Signaling is used. BitOriented - Indicates that E1 Channel Associated Signaling is used. MsgOriented - Indicates that Common Channel Signaling is in use on channel 16 of an E1 link or channel 24 of a T1.
Line Buildout	This field displays the possible characteristics of DS1 when Line Buildout is established: Unknown - Indicates that the setting is neither readable nor writable. Zero - 0db of attenuation. Minus 7.5 - Negative 7.5 db of attenuation. Minus 15 - Negative 15 db of attenuation.

DS1 Configuration View (Continued)

Line Status	This field displays the line status of the interface. It contains loopback, failure, received alarm and transmitted alarm information. Possible line statuses are: NoAlarm - No alarm present. RcvFarEndLOF - Far end LOF (e.g., yellow alarm). XmtFarEndLOF - Near end sending LOF Indication. RcvAIS - Far end sending AIS. XmtAIS - Near end sending AIS. LossOfFrame - Near end LOF (e.g., red alarm). LossOfSignal - Near end Loss of Signal. LoopbackState - Near end is looped. T16AIS - E1 TS16 AIS. RcvFarEndLOMF - Far end sending TS16 LOMF. XmtFarEndLOMF - Near end sending TS16 LOMF. RcvTestCode - Near end detects a test code. OtherFailure - Any line status not defined here.
Fractional Table	Double-clicking on an entry in this table provides access to the DS1 Fractional Table Configuration View.

DS1 Fractional Table Config View

The DS1 Fractional Table identifies which channels associated with a CSU are being used to support a logical interface, i.e., an entry in the interfaces table from the Internet-standard MIB. This view describes the different DS1 fractional states.

To access:	Double-click on an entry in the DS1 Fractional Table in the DS1 Configuration Table View.
Channel Number	The channel number for this entry.
IF Index	This field displays the index value uniquely identifying an interface to a DS1.
Interface	This scrollbox lists the DS1 interfaces available on the device. Interfaces can be assigned to specific channels.
Timeslots	Indicates the twenty-four channels (timeslots) available for interface assignments.
Bandwidth	Displays the percentage of the Total DS1 line's bandwidth in use by the interface.
Settings	This indicates the mode that you are in. While in Edit mode you can modify the interfaces, the bandwidth, and the timeslots. While in View mode you are watching the changes as they occur dynamically on the DS1 line.
Apply	Click on this button to apply any modifications made.
Cancel	Click on this button to close the window and cancel any modifications that have not been applied.

Chapter 4

RS-232 Application

RS-232 is one of several common data terminal equipment (DTE)/data circuit-terminating equipment (DCE) interface standards. This chapter describes the views available from the RS-232 applications.

The RS-232-like Hardware Port MIB includes RS-232, RS-422, RS-423, V.35, and other asynchronous or synchronous serial physical links with a similar set of control signals. The RS-232-like Hardware Device MIB applies to interface ports that might logically support the Interface MIB, a Transmission MIB, or the Character MIB. The most common example is an RS-232 port with modem signals.

The RS-232-like MIB is one of a set of MIBs designed for complementary use, including, the Character MIB, the PPP MIB, the RS-232-like MIB, and the Parallel-printer-like MIB. The RS-232-like MIB and the Parallel-printer-like MIB represent the physical layer, providing service to higher layers such as the Character MIB or PPP MIB. Further MIBs may appear above these.

The RS-232 icon supports synchronous objects of the MIB while the RS-232 async icon supports the asynchronous MIB objects. Asynchronous transmission uses start and stop bits to control transmission in which a single character is transmitted in each data unit. Each icon supports an application-specific view.

There are three RS-232 applications:

- RS-232 RFC1317 (CtWANAppRS232)
- RS-232Sync RFC1317Sync
- RS-232Async RFC1317Async

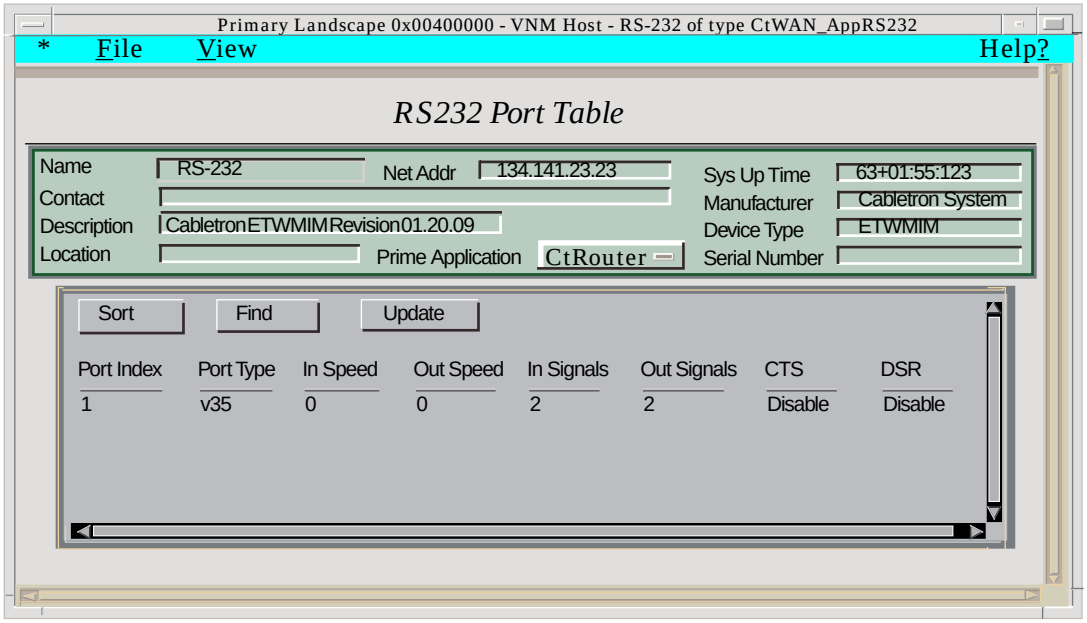
RFC 1317 describes the characteristics of the general RS-232 interface (port), while RFC 1317Sync and Async describe the characteristics of RS-232 sync and async ports, respectively.

RS-232 Views

There is one application-specific subview available for the RS-232 application from the CtWANAppRS232 Icon Subviews menu, the RS232 Port Table View.

The RS232 Port Table View is shown in Figure 4-1. Further subviews are opened by double-clicking table entries and/or clicking buttons.

Figure 4-1. RS232 Port Table View



RS232 Port Table View

You can update, sort, or search the table for specific information. Double-clicking on a table entry opens the RS232 Port Table Configuration View.

To access: Select **RS232 Port Table** from the Icon Subviews Menu.

Port Index	A unique value for each port, usually mapped to external connectors. This value must remain constant from one re-initialization of the network management agent to the next.

RS232 Port Table View (Continued)

Port Type	The port's hardware type. Possible entries are: RS232, RS422, RS423, v35, or other.
In Speed	The port's input speed in bits per second.
Out Speed	The port's output speed in bits per second.
In Signals	The number of input signals for this port in the input signal table.
Out Signals	The number of output signals for this port in the output signal table.
CTS	When enabled, this field indicates that a CTS (Clear to Send) signal is generated. (ETWMIM only)
DSR	When enabled, this field indicates that a DST (Data Set Ready) signal is generated. (ETWMIM only)

RS232 Port Table Configuration View

This view provides the same information as the Port Table View for the selected port and allows you to modify the configuration. It also presents two Detail buttons that open subviews.

To access: Double-click on an entry in any of the Port Table View fields.

Input Signals	Click on this button to access the RS232 Port Input Signals Table View, which provides the number of input signals for the port in the input signal table. The table contains entries only for those signals the software can detect.
Output Signals	Click on this button to access the RS232 Port Output Signals Table View, which provides the number of output signals for the port in the output signal table. The table contains entries only for those signals the software can detect.

RS232 Port Input Signals Table View

This view provides the number of input signals for the port. The table contains entries only for those signals the software can detect.

To access: Click on the **Input Signals Detail** button in the RS232 Port Table Configuration View.

Port ID	The unique numeric identifier for the port corresponding to the table entry.
Signal Name	Indicates the hardware signal. Possible entries are: rts Request to Send cts Clear to Send dsr Data Set Ready dtr Data Terminal Ready ri Ring Indicator dcd Received Line Signal Detector sq Signal Quality Detector srs Data Signaling Rate Selector srts Secondary Request to Send scts Secondary Clear to Send sdcd Secondary Received Line Signal Detector
State	The current signal state. Possible entries are: None, On, & Off.
Changes	The number of times that the signal has changed its signal state.

RS232 Port Output Signals Table View

The view provides the number of output signals for the port. The table contains entries only for those signals the software can detect.

To access: Click on the Output Signals **Detail** button in the RS232 Port Table Configuration View.

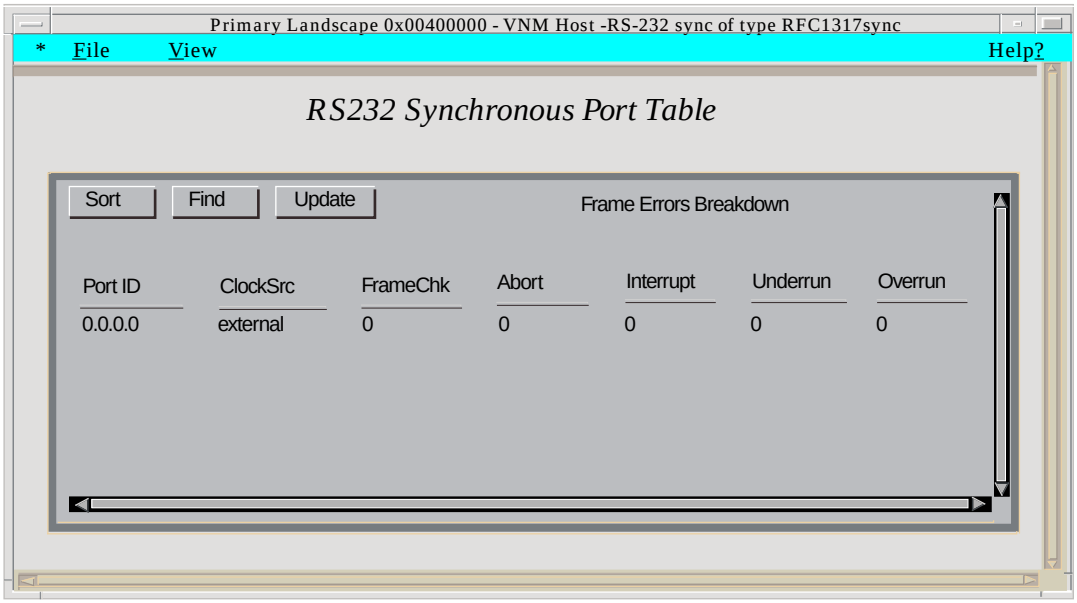
Port ID	The unique numeric identifier for the port corresponding to the table entry.
Signal Name	Indicates the hardware signal. Possible entries are: rts Request to Send cts Clear to Send dsr Data Set Ready dtr Data Terminal Ready ri Ring Indicator dcd Received Line Signal Detector sq Signal Quality Detector srs Data Signaling Rate Selector srts Secondary Request to Send scts Secondary Clear to Send sdcd Secondary Received Line Signal Detector
State	The current signal state. Possible entries are: None, On, & Off.
Changes	The number of times that the signal has changed its signal state.
CTS	When enabled, this field indicates that a CTS (Clear To Send) signal is generated.
DSR	When enabled, this field indicates that a DSR (Data Set Ready) signal is generated.

RS232 Synchronous Views

There is one application-specific subview available for the RS232 Sync application from the RFC1317sync Icon Subviews menu, the RS232 Synchronous Port Table View.

The RS232 Synchronous Port Table View is shown in Figure 4-2. Further subviews are opened by double-clicking table entries.

Figure 4-2. RS232 Synchronous Port Table View



RS232 Synchronous Port Table View

You can update, sort, or search the table for specific information. Double-clicking on a table entry opens the RS232 Synchronous Port Table Detail View, which provides a color-coded pie chart of Error Breakdown for the selected port.

To access: Select **Synchronous Port Table** from the Icon Subviews Menu.

Port ID	A unique value for each port, usually mapped to external connectors. This value is the same as the RS-232 Port Index.

RS232 Synchronous Port Table View (Continued)

ClockSrc	The source of the port's bit rate clock. Split means the transmit clock is internal and the receive clock is external.
Frame Check Errors	The total number of frames with an invalid frame check sequence, input from the port since system re-initialization and while the port state was Up or Test.
Aborted Frames	The number of frames aborted on the port due to receiving an abort sequence since system re-initialization and while the port state was Up or Test.
Interrupted Frames	The total number of frames that failed to be received or transmitted on the port due to loss of modem signals since system re-initialization and while the port state was Up or Test.
Xmt. Underrun Errors	The total number of frames that failed to be transmitted on the port, since system re-initialization and while the port state was Up or Test, because data was not available to the transmitter in time.
Rcv. Overrun Errors	The total number of frames that failed to be received on the port, since system re-initialization and while the port state was Up or Test, because the receiver did not accept the data in time.

Synchronous Port Detail View

The Synchronous Port Detail View provides configuration information on a selected entry from the RS232 Synchronous Port Table, and allows you to modify the configuration values. This view also provides a color-coded pie chart displaying error breakdown statistical information. A Clock Source button can be toggled between external, internal and split.

To access: Double-click on an entry in the Synchronous Port Table

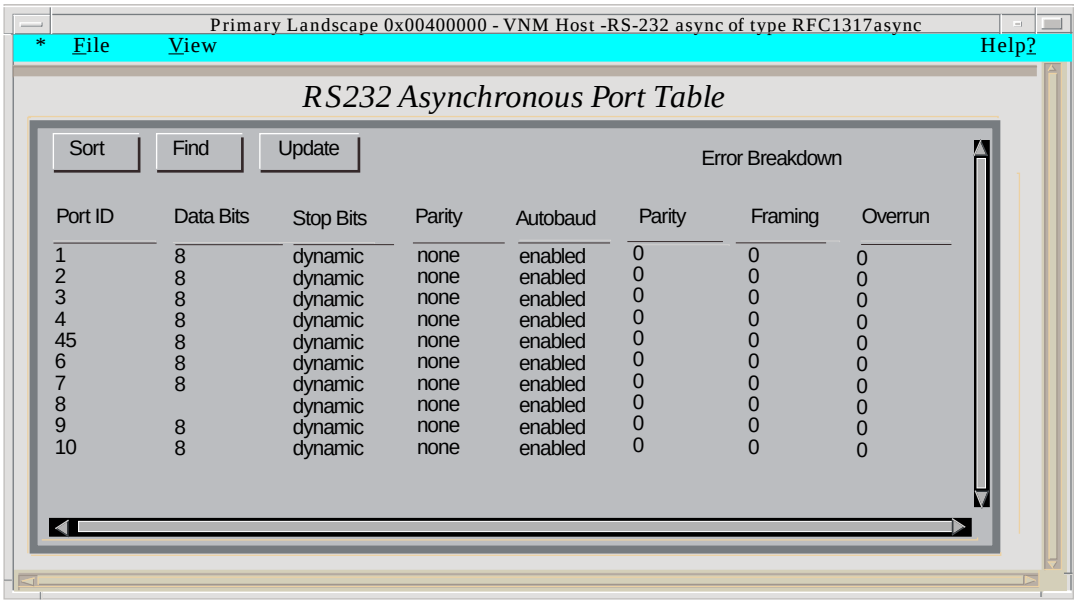
Error Breakdown	Each statistic is presented as a total amount since the device was initialized and as a percentage of overall traffic. Three buttons at the bottom of the pie chart select the way in which the data is represented (Total, Delta, and Accum). Another button, Clear, works in conjunction with the Accum button.

RS232 Asynchronous Views

There is one application-specific subview available for the RS232 Asynchronous application from the RFC1317async Icon Subviews menu, the RS232 Asynchronous Port Table View.

The RS232 Asynchronous Port Table View is shown in Figure 4-3. Other subviews are opened by double-clicking table entries.

Figure 4-3. RS232 Asynchronous Port Table View


Primary Landscape 0x00400000 - VNM Host -RS-232 async of type RFC1317async
* File View Help?
RS232 Asynchronous Port Table
Sort
Find
Update
Error Breakdown
Port ID Data Bits Stop Bits Parity Autobaud Parity Framing Overrun
1 8 dynamic none enabled 0 0 0
2 8 dynamic none enabled 0 0 0
3 8 dynamic none enabled 0 0 0
4 8 dynamic none enabled 0 0 0
45 8 dynamic none enabled 0 0 0
6 8 dynamic none enabled 0 0 0
7 8 dynamic none enabled 0 0 0
8 dynamic none enabled 0 0 0
9 8 dynamic none enabled 0 0 0
10 8 dynamic none enabled 0 0 0

RS232 Asynchronous Port Table View

You can update or sort the table for specific information. Double-clicking on a table entry opens the RS232 Asynchronous Port Detail View, which allows you to modify the configuration of the selected entry.

To access: Select **Asynchronous Port Table** from the RFC1317async Icon Subviews Menu.

Port ID	The port index for this entry.

RS232 Asynchronous Port Table View (Continued)

Data Bits	The number of bits allowed in a character.
Stop Bits	The number of stop bits. In the RS232 Asynchronous Port Detail View, you may alter this value. Possible options are One, Two, One-and-Half, and Dynamic.
Parity	The character parity bit. In the RS232 Asynchronous Port Detail View, you may alter this value. Possible options are None, Odd, Even, Mark, and Space.
AutoBaud	This field indicates whether the port can automatically sense input speed. You may Enable or Disable this feature in the RS232 Asynchronous Port Detail View. When enabled, a port may set autobaud values differently than the configured values for speed, parity, and character size. As a result, the network management system may temporarily observe values different from the values previously set.
Parity Errors	The total number of characters with a parity error, input from the port since system re-initialization and while the port state was Up or Test. Possible choices are None, Odd, Even, Mark, and Space.
Framing Errors	The total number of characters with a framing error, input from the port since system re-initialization and while the port state was Up or Test.
Overrun Errors	The total number of characters with an overrun error, input from the port since system re-initialization and while the port state was Up or Test.

RS232 Asynchronous Port Detail View

This view provides configuration information on a selected entry from the RS232 Asynchronous Port Table, and allows you to modify the configuration values. Three buttons can be toggled to change the Stop Bits, Parity and Autobaud settings. This view also provides a color-coded pie chart displaying error breakdown statistical information.

To access:	Double-click on any entry in the RS232 Asynchronous Port Table
Error Breakdown	This pie chart displays a breakdown of errors. Each statistic is presented as a total amount since the device was initialized and as a percentage of overall traffic. Three buttons at the bottom of the pie chart select the way in which the data is represented (Total, Delta, and Accum). Another button, Clear, works in conjunction with the Accum button.
Parity Errors	The total number of characters with a parity error, input from the port since system re-initialization and while the port state was Up or Test. Possible choices are, None, Odd, Even, Mark, and Space.
Framing Errors	The total number of characters with a framing error, input from the port since system re-initialization and while the port state was Up or Test.
Overrun Errors	The total number of characters with an overrun error, input from the port since system re-initialization and while the port state was Up or Test.

Chapter 5

WAN Application

Wide Area Network (WAN) data link technology is generally used to implement point-to-point connections between devices. This chapter describes the views accessed from the WAN application.

WANs, or wide area networks, connect networks or devices separated by long distances. A phone company, or similar common communications service with analog telecommunications circuit equipment, usually provides the interconnection. The circuitry itself ranges from ordinary telephone circuits to specialized high-speed telecommunications circuits. Examples of WAN technologies include Frame Relay, Switched Multimegabit Data Service (SMDS), X.25 and Asynchronous Transfer Mode (ATM).

Most telecommunications common carriers provide high-speed T1 and T3 transmission facilities, which have 1.544 megabit per second (Mbps) and 45 Mbps digital transmission rates, respectively.

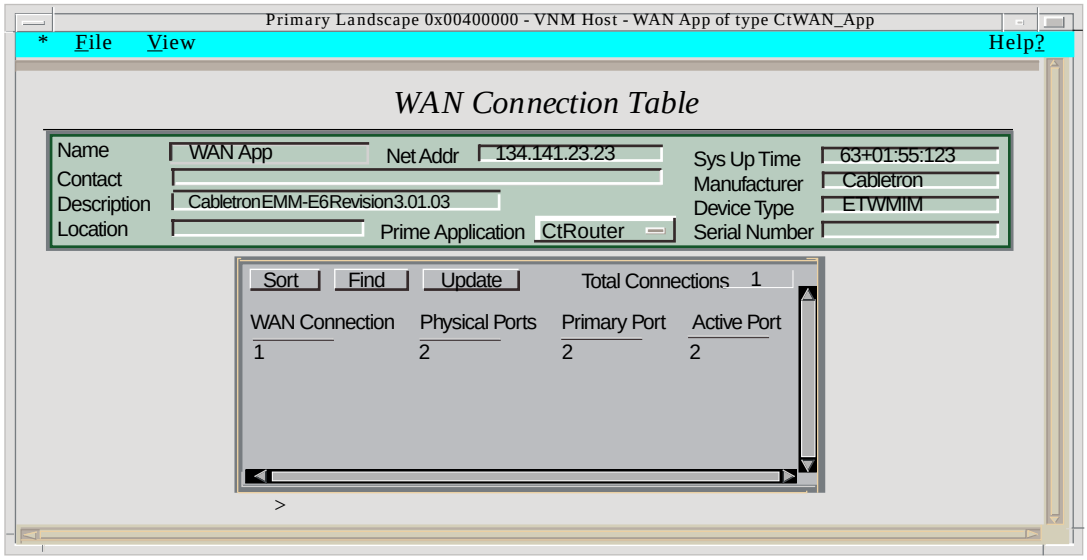
CtWANApp, the Cabletron proprietary MIB for the WAN application, references RFC 1406.

WAN Views

There is one application-specific view accessed from the CtWANApp Icon Subviews menu: the WAN Connection Table View.

The WAN Connection Table View is shown in Figure 5-1.

Figure 5-1. WAN Connection Table



WAN Connection Table View

You can sort, search for, or update information within this table. Double-click on a table entry to open the WAN Connection Physical Ports View, which provides the same information as the WAN Connection Table for the selected interface as well as providing an avenue to more detailed Physical Port information. You can also modify some field values in the WAN Connection Physical Ports View.

To access: Select **WAN Connections** from the CtWANApp Icon Subviews Menu.

Total Connections	This field displays the number of connections made.
WAN Connection	This field displays the index value uniquely identifying the connection.
Physical Ports	This field displays the number of physical ports that exist on this WAN connection.

WAN Connection Table View (Continued)

Primary Port	This field displays the port number to which a WAN connection would default. When redundancy is disabled this physical port will always be used. When redundancy is enabled this physical port will be the primary port.
Active Port	This field displays the physical port number which is active for the WAN connection.

One subview, the WAN Connections Physical Ports View, is accessed from the WAN Connection Table View and is described below/

WAN Connection Physical Ports View

This view provides the following information in addition to the fields already described in WAN Connection Table View. You can print the table.

To access: Double-click on a table entry in WAN Connection Table View.

Port Index	Displays the value identifying each physical port on a WAN connection.
Type	Displays the type of WAN connection in use by that port. Possible connections are: None - Indicates that the physical port has no connector. T1 - Indicates that the physical port is the US version of DS1. E1 - Indicates that the physical port is the European version of DS1. Synchronous - Indicates that the physical port is a serial port.
Double Click For	Double-click on a table entry for a detailed view of the related field, e.g., double-clicking for a Synchronous Port displays the RS232 Port Table Configuration View, which includes the Input and Output Signals Detail buttons and access to the table views these buttons provide. (See RS232 Port Table View.)

The WAN Connection Interface Table View is accessed from the WAN Connections Physical Ports View and is described below.

WAN Connection Interface Table View

This table view provides information about the physical port's interfaces. You can print the results of the table. Double-clicking a table entry opens the WAN Interface View, which provides similar information to the table in the WAN Connection Interface Table View for the selected interface. You can modify field values in this table.

To access:	Double-click on a Physical Ports Table entry's Port Index or Type, in the WAN Connection Physical Ports View.
WAN Connection	Displays the index value identifying a connection to the WAN port.
Physical Port	Displays the index value uniquely identifying the WAN port.
Entry Index	Displays the index value identifying the WAN port and associated connection.
If Index	Displays the index value of this entry as an interface to a WAN in the MIB-II Interface Table.
Protocol	Displays the protocol that should be run on this interface. This field is modifiable. Accepted values are product dependent. Refer to the Cabletron Systems *BRIM-WT1 User's Guide* for more information.
Compression	This field indicates whether compression is On or Off. You can modify this field.
MTU	Designates the MTU (Maximum Transmission Unit) that can be transmitted on the selected interface.
Line Coding	This describes the line coding. Options are, JBZS, B8ZS, HDB3, ZBTSI, AMI, and Other.
CRC Length	Displays the length of the cyclical redundancy check (CRC). This value can be either 16-bits or 32-bits.

Chapter 6

Frame Relay Application

Frame Relay is viewed as a multi-access media and not as a group of point-to-point connections.

Frame Relay acts as a single interface (or physical connection) to the network with many destinations. The resulting view allows a network manager to group the destinations or virtual connections with corresponding physical connections, permitting the ability to troubleshoot the network.

Frame Relay Views

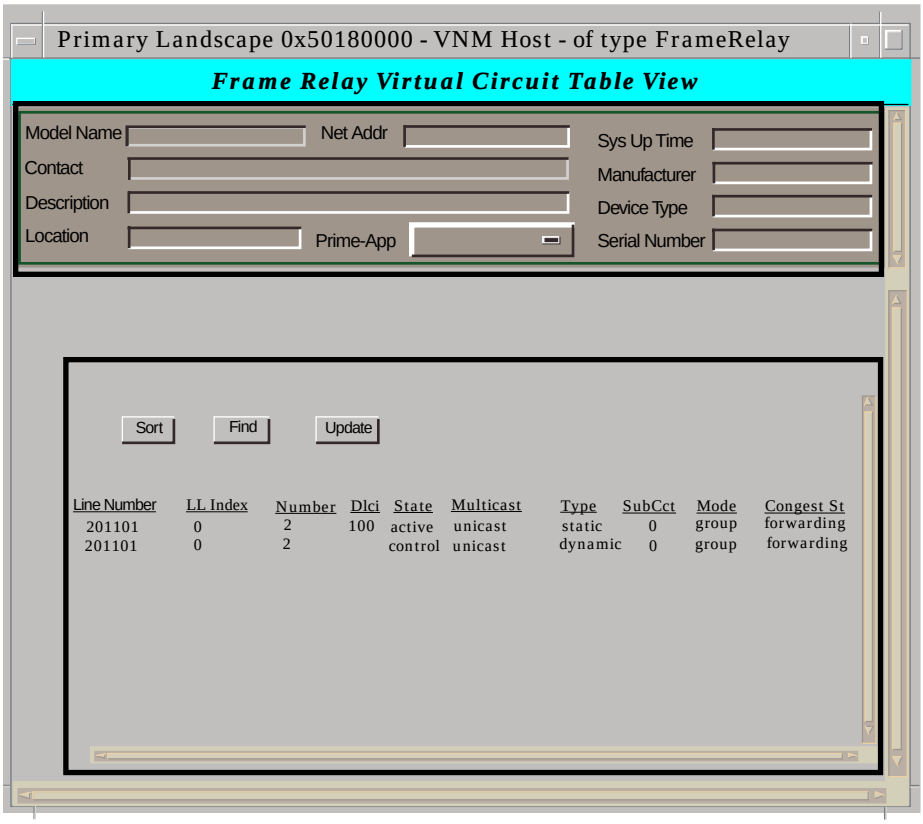
Three application-specific subviews are available for the Frame Relay application.

- Virtual Circuit Table View
- Circuit Error Table View
- Dlcmi Table View

These subviews are accessed from the RelayApp icon (in Icon Mode) or the **Frame Relay** text label (in List Mode) Icon Subviews menu.

Figure 6-1 shows the Frame Relay Virtual Circuit Table View. To access information on a specific virtual circuit, double-click any table entry to open the Frame Relay Virtual Circuit Detail View.

Figure 6-1. Frame Relay Virtual Circuit Table View



Virtual Circuit Table View

To access: Select **VCircuit Table** from the Icon Subviews menu.

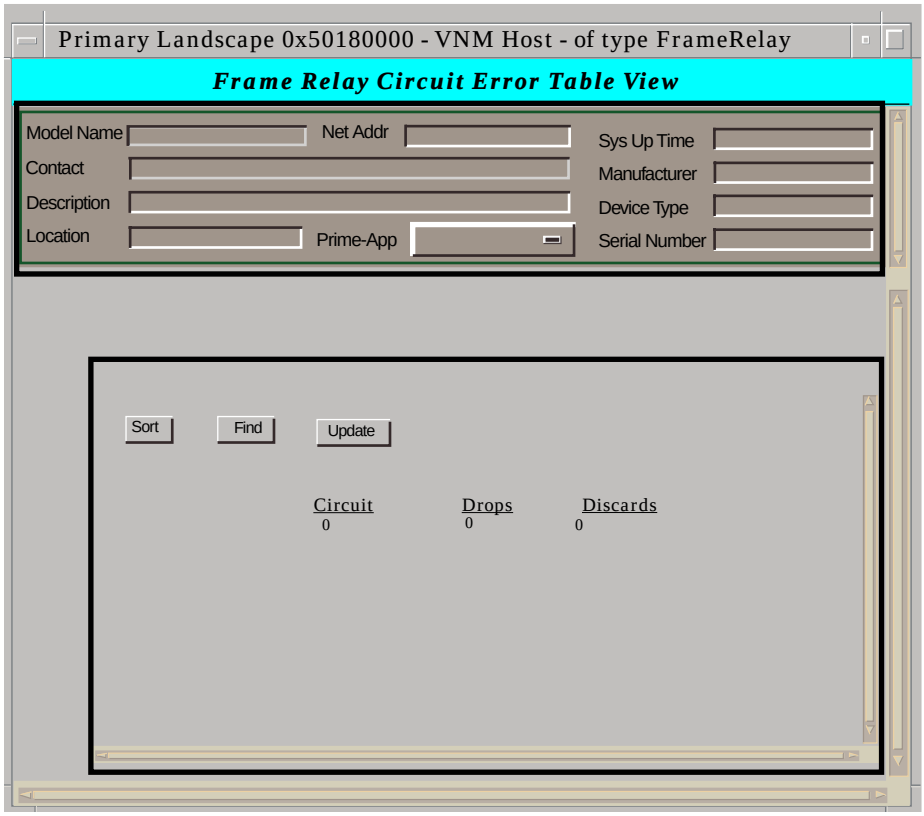
Line Number	Line number on which the associated frame relay interface resides.
LL Index	Identifies the lower layer in cases where the lower layer may be something other than the physical layer. For example, if Frame Relay is running over an ATM virtual circuit, the LL Index identifies the ATM virtual circuit.
Number	Circuit number of this interface.

Virtual Circuit Table View (Continued)

Dlci	Frame relay "address" of the virtual circuit.
State	State of this virtual circuit. Possible states are Invalid, Active, Inactive, Xoff and Control.
Multicast	Indicates whether this Dlcmi is used for multicast or single destination.
Type	Indicates whether the virtual circuit was manually created (Static) or created by the Data Link Control Management interface (Dynamic).
Mode	Indicates whether the virtual circuit's mode is Group (the virtual circuit is one of many on a circuit), Hybrid (the virtual circuit is one of many on a circuit for protocol traffic, but is a separate circuit for bridging), or Direct (the virtual circuit is a separate circuit for all applications).
SubCct	Circuit number to use for this VC when configured in hybrid (for bridging) or direct access (VC as a circuit) mode.
Congest St	Indicates whether or not the virtual circuit is in a congested state. Possible states are Forwarding and Congested. If the state is Congested, no traffic will be sent on this virtual circuit.

Figure 6-2 provides an example of the Frame Relay Virtual Circuit Error Table View.

Figure 6-2. Frame Relay Virtual Circuit Error Table View



Virtual Circuit Error Table View

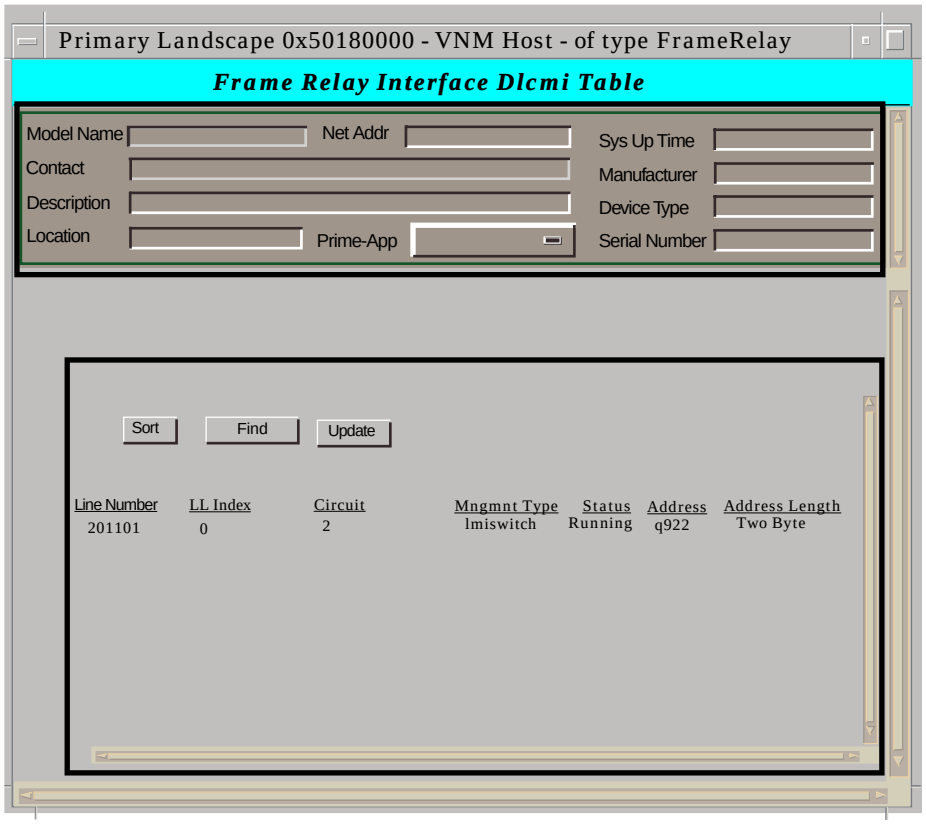
The Frame Relay Virtual Circuit Table View provides statistical information on frame relay virtual circuits.

To access: Select **VCircuit Table** from the Icon Subviews menu.

Circuit	Frame relay circuit number. To see detailed error information on a specific virtual circuit, double-click any table entry for the circuit.
Drops	Number of frames dropped at the circuit level. A drop occurs because the particular protocol within the inbound frame is not registered for this circuit.
Discards	Number of frames discarded at the circuit level. A discard occurs because the outbound frame was too long or too short.

Figure 6-3 provides an example of the Frame Relay Interface DLCMI Table View.

Figure 6-3. Frame Relay Interface DLCMI Table View



Interface Dlcmi Table View

To access: Select **IF DLCMI Table** from the Icon Subviews menu. Clicking any table entry opens the Interface Dlcmi Table Detail View, which allows you to change the field information. The Interface Dlcmi Table View provides the following information on your frame relay virtual circuits:

Line Number	Line number on which the associated frame relay interface resides.

Interface Dlcmi Table View (Continued)

LL Index	Identifies the lower layer in cases where the lower layer may be something other than the physical layer. For example, if Frame Relay is running over an ATM virtual circuit, the LL Index identifies the ATM virtual circuit.
Circuit (or Number)	Circuit number representing this interface.
Mngmnt Type	Indicates which Data Link Connection Management Scheme is active, and implies what DLCMI it uses. Possible management types are None, Lmi, T1617b, Annexa, Limswitch, and Annexaswitch.
Status	Indicates the state of the interface. Possible statuses are Running (indicating LMI was successful or there is no DLCMI and the system is operational)
Address	Address format in use on the frame relay interface. Possible addresses are q921, q922march90, q922november90, and q922.
Address Length	Address length in octets. In the case of q922 format, this indicates the entire length of the address, including the control portion. Possible address lengths are Twobyte, Threebyte, and Fourbyte.
Dlci	Frame relay “address” of the virtual circuit.
Delete	Indication to delete this frame relay interface.
State	State of this virtual circuit. Possible states are Invalid, Active, Inactive, Xoff and Control.
State Set	Enables you to set the state of a virtual circuit. Possible settings are Invalid, Active, and Inactive.
Multicast	Indicates whether this Dlcmi is used for multicast or single destination.

Interface Dlcmi Table View (Continued)

Type	Indicates whether the virtual circuit was manually created (Static) or created by the Data Link Control Management interface (Dynamic).
Mode	Indicates whether the virtual circuit's mode is Group (the virtual circuit is one of many on a circuit), Hybrid (the virtual circuit is one of many on a circuit for protocol traffic, but is a separate circuit for bridging), or Direct (the virtual circuit is a separate circuit for all applications).
Congestion Disable	Indicates whether the congestion algorithm should be used for this virtual circuit. If this is not set, the value is inherited from the Dlcmi record.

Chapter 7

Token Ring Application

Token Ring and IEEE 802.5 are the primary examples of networks that use a ring-structured topology and token-passing as the means of data transmission. This section describes the views available for the Token Ring applications.

Token-passing networks use a small frame or token that moves around the network. In order for a station to transmit it must have possession of the token. If a node in possession of the token has no information to transmit, it passes the token on to the next end station in line. When a station with the token does have information to send, it alters the token (which becomes a start-of-frame sequence), appends the information, and transmits to the next station on the ring. The information frame circles the ring until it reaches the intended destination.

During this transmission process, no token is available to other stations along the network (unless the ring supports early token release, a process that allows a station to release the token prior to final data packet removal) and stations with information to transmit must wait. Because of this, no collisions can occur in Token Ring networks.

There are two Token Ring applications and corresponding model types:

- Token Ring App TokenRingApp
- Token Ring IF App TokenRingIFApp

Token Ring Views

One application-specific subview is available for the Token Ring application from the TokenRingApp Icon, the Token Ring Detail View.

Token Ring Detail View

This view provides three color-coded pie charts displaying Token Ring statistical information. Each statistic is presented as a total amount since the device was initialized and as a percentage of overall traffic.

To access: Select **Detail** from the Icon Subviews menu.

Transmitted Beacon Count	The number of times this interface has transmitted a beacon frame.
Remove Ring Station Count	The number of times the interface has received a Remove Ring Station MAC frame request.
Soft Error Count	The number of times the interface has detected an immediately recoverable fatal error.
Isolating Soft Errors Breakdown	This pie chart displays a breakdown of the following statistics: Line, Burst, and A/C.
Line	The number of frames copied or repeated by a station.
Burst	The number of times a station detects the absence of transitions for five half-bit timers.
A/C	The number of times a station has incorrectly set the AC bit.
Non-Isolating Soft Errors Breakdown	This pie chart displays a breakdown of the following statistics: Lost Frames, Congestions, Frame Copied, Recoveries, and Token.
Lost Frames	The number of times a station has had its TRR timer expire while trying to transmit.
Congestions	The number of times a station recognizes a frame addressed to it, but has no available buffer space.
Frame Copied	The number of times a station recognizes a frame addressed to it, and detects that the FS field A bit is set to 1.

Token Ring Detail View (Continued)

Recoveries	The number of Claim Token MAC frames received or transmitted after the ring has received a Ring Purge MAC frame.
Token	The number of times the station acting as active monitor recognizes an error condition requiring a token be transmitted.
Hard Errors Breakdown	This pie chart displays the breakdown of the following statistics: Abort Trans, Internal, Signal Loss, Lobe Wire, and Frequency.
Abort Trans	The number of times the station transmits an abort delimiter while transmitting.
Internal	The number of times the station recognizes an internal error.
Signal Loss	The number of times the interface has detected the loss of signal condition from the ring.
Lobe Wire	The number of times the interface has detected an open or short circuit in the lobe data path.
Frequency	The number of times that the interface has detected that the frequency of the incoming signal differs from the expected frequency by more than the specified standard.

Token Ring IF Views

There are three application-specific subviews available for the Token Ring IF application from the TokenRingIfApp Icon, the Token Ring Performance, Token Ring Configuration, and Token Ring Detail views. The Token Ring IF Performance View displays a breakdown of statistics for the bridging application, with the Detail View button accessing the Token Ring Detail View, which is described earlier in this section.

Token Ring IF Configuration View

To access: Select Configuration from the TokenRingIfApp Icon Subviews menu.

Commands	This field provides a button that allows you to send the following commands to the device: None, Open, Reset and Close.
None	No command is sent to the device. This is the default setting.
Open	Inserts the device into the Token Ring network.
Reset	Resets the device with all counters retaining their original state.
Close	Removes the device from the Token Ring network.
Ring Speed	This field provides a button that allows you to configure the device with the bandwidth of the ring. You can choose from Unknown, 16 Megabits, 4 Megabits, and 1 Megabits.
Active Monitor Process	This field provides a button that allows you to configure the device as an Active Monitor to participate in the active monitor bid on the Token Ring network, or to disable active monitor participation. Possible values are DoNotParticipate and Participate.
Functional Address Bitmask	The bit mask of all Token Ring functional addresses for which this interface will accept frames. You can enter the desired mask.
Ring State	Indicates whether this interface is entering or leaving the ring.
Ring Open-Status	The success, or reason for failure, of the station's most recent attempt to enter the ring.
Upstream Neighbor	The MAC address of the upstream neighbor station.
Ring Status	This area contains read-only indicator buttons displaying the current status of the network. The Ring Status indicator buttons are defined below.

Token Ring IF Configuration View (Continued)

RingRecovery	The ring purge command has not yet been issued to restart communications.
SingleStation	The device has detected itself as the only station on the ring.
RemoveReceived	A station is removing itself from the ring.
Auto-RemovalError	The device has removed itself due to the beaconing auto-removal process.
LobeWireFault	The device has detected an error condition on the lobe wires.
TransmitBeacon	The device is transmitting a beacon frame.
SoftError	The device is sending an error report frame to the Ring Error Monitor.
HardError	The device has detected the ring is going into a beaconing state.
SignalLoss	The device has detected a signal loss condition on the ring.

Chapter 8

DLSw Application

Data Link Switching (DLSw) is an IBM extension to source route bridging that allows otherwise unroutable Systems Network Architecture (SNA) and NetBIOS frames to be routed.

DLSw, running on an IBM 6611 network processor, is the transport of data at the LPDU layer across a transparent transport network. There are two types of data link switching: Local and Remote.

In local data link switching, the data link switching function is performed within a single 6611. It is used for SNA transport only. Local data link switching supports communication between a LAN-attached SNA device and a synchronous data link control (SDLC) secondary station that is link-attached to the 6611. The secondary station is assigned a MAC sublayer address so that it appears to other network devices to be on a LAN.

In remote data link switching, stations attached to two or more 6611s communicate across an IP network (WAN) using data link switching. Remote data link switching is used for both SNA and NetBIOS transport. An SNA or NetBIOS station attached to a 6611 uses remote data link switching to communicate with an SNA or NetBIOS station attached to another 6611. SNA stations may be link-attached or LAN-attached to the 6611, that is, both SDLC-to-LAN and LAN-to-LAN communication is supported across a WAN. NetBIOS stations must be LAN-attached.

DLSw Views

The DLSw Application appears as a major icon in the Application View of the device it is running on. The DLSw Application supports only one application-specific option from the Icon Subviews menu, **Configuration,** which displays the Information View. The Information View contains three fields and several buttons leading to more detailed views.

Information View

To access: Select **Configuration** from the Icon Subviews menu.

VirtualRingSegNo	The Token Ring segment number (0 through 4095) used in all frames passed to or from the IBM 6611 Data Link Switching function.
FrameFilterType	The type of filtering applied using the Local Frame Filter Table and the Remote Frame Filter Table. If this field has the value: **Permit** — Frames will be forwarded if they meet the filter criteria of any filter definition in these tables. **Deny** — Frames will be prevented from being forwarded if they meet the filter criteria of any filter definition in these tables.
NameFilterType	The type of Net BIOS filtering applied using the Local Name Filter Table and the Remote Name Filter Table. If this field has the value: **Permit** — Frames will be forwarded if they meet the filter criteria of any NetBIOS filter definition in these tables. **Deny** — Frames will be prevented from being forwarded if they meet the filter criteria of any NetBIOS filter definition in these tables.
Router Table	Clicking on the Router Table button displays the DLS Participating Routers View described later in this section.
SNA Station Table	Clicking on the SNA Station Table button displays the SNA Station View described later in this section.
Local Frame Filter	Clicking on the Local Frame Filter Table button displays the Local SNA Frame Filter View described later in this section.
Local Name Filter	Clicking on the Local Name Filter Table button displays the Local NetBIOS Filter View described later in this section.
Remote Frame Filter	Clicking on the Remote Frame Filter Table button displays the Remote SNA Frame Filter View described later in this section.

Information View (Continued)

Remote Name Filter	Clicking on the Remote Name Filter Table button displays the Remote NetBIOS Filter View described later in this section.
SNA Default Dest	Clicking on the SNA Default Dest Table button displays the SNA Default Destination View described later in this section.
NetBIOS Default Dest	Clicking on the NetBIOS Default Dest Table button displays the NetBIOS Default Destination View described later in this section.
Circuit Diagnostic	Clicking on the Circuit Diagnostics button displays the Circuit Diagnostics View described later in this section.
Poll and Status Info	Clicking on the Poll and Status Information button displays the Poll and Status View described later in this section.
Data Transfer Info	Clicking on the Data Transfer Information button displays the Circuit Data Transfer View described later in this section.

DLS Participating Routers View

To access: Click the **Router Table** button in the DLSw Information View. This view contains the Router Table which provides the following information regarding all routers (other 6611s) participating in Data Link Switching.

Router Address	The IP address of the router this entry describes.	
RouterStatus	The current state of the remote connection, Active or NotActive.	
RouterConfig	The origin of this table entry. If this field has the value:	
	User	The router was defined via the Configuration Program.
	System	The router was defined automatically as a result of a connection request from another router.

Station View

To access: Click on the **SNA Station Table** button in the DLSw Information View. This view contains the following information for SNA stations attached to this router. Each entry spans two lines; the IfIndex and the StationAdd are shown on both lines.

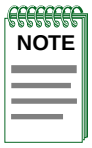
IfIndex	The index of the port to which the station is attached.
Station Add	The SDLC address of this station (1 through 255).
TxWindowCount	The number of SDLC information frames to send to this station before turning the line around to receive a response (1 through 7).
ReTxCount	The number of contiguous information frame bursts that will be transmitted to this station before declaring a permanent transmission error (1 through 50).

Station View (Continued)

ReTxThold	The number of information frame retransmissions allowed expressed as a percentage of the total information frame transmissions. This is the maximum rate of retransmissions allowed before an error log entry is made.
FrcDiscTmout	The number of seconds that the 6611 will wait after requesting a disconnect from the link (DISC) before forcing a disconnect (1 through 600).
MaxIfldSize	The value, in bytes, of the maximum I-field size (a multiple of 256 plus 9 between 265 and 30729).
PriRpollTmout	The length of time, in tenths of a second, that the primary station will wait for a response from the secondary station (1 through 250).
PriRpollCnt	The number of times that the primary station will poll the secondary station unsuccessfully before marking the station as not working (3 through 50).
PriRpollThold	The maximum number of repolls allowed, expressed as a percentage of the total polls sent to the secondary station. This is the maximum rate of repolls allowed before a temporary error is declared and logged in the system error log.
PriSlwLstTmout	The number of seconds that the primary station will wait between polls to stations on the slow list (1 through 60).
StatnSrcAddr	The Token Ring physical (MAC) address used for this station.
StatnDstAddr	The Token Ring physical (MAC) address to which this station should be connected. If this information is not available, this field will have a length of zero.

Local SNA Frame Filter View

To access:	Click on the **Local Frame Filter Table** button in the DLSw Information View. The Local Frame Filter Table displays filters definitions that can be applied to SNA frames received from local LAN segments. Each entry shows one filter definition.
FilterID	A unique identifier for this filter (1 through 100).
SourceAddress	The source MAC address to which this filter is applied.
SourceMask	A mask indicating the bits of the source address considered significant when using the filter. For every bit equal to 1 in the mask, the same bit in the SourceAddress is compared to the equivalent bit in the source address in the incoming frame.
DestAddress	The destination MAC address to which this filter is applied.
DestMask	A mask indicating the bits of the destination address considered significant when using the filter. For every bit equal to 1 in the mask, the same bit in the DestAddress is compared to the equivalent bit in the incoming frame's destination address.

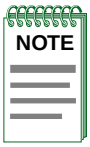


A frame passes the filtering criteria if both the source address and destination address comparisons match. If the value in the FrameFilterType field in the Information View is Permit, frames passing the criteria are forwarded.

Local NetBIOS Filter View

To access: Click on the **Local Name Filter Table** button in the DLSw Information View. This view provides information regarding the filtering of NetBIOS frames received from local LAN segments. Each entry shows one filter definition.

FilterID	A unique identifier for this filter (1 through 100).
SourceAddress	The source NetBIOS name that the source address in the incoming frame is compared with.
DestAddress	The destination NetBIOS name to which the destination address in the incoming frame is compared.



A frame passes the filtering criteria if both the source address and destination address comparisons match. If the value in the NameFilterType field in the Information View is Permit, frames passing the criteria are forwarded.

Remote SNA Frame Filter View

To access: Click on the **Remote Frame Filter Table** button in the DLSw Information View. This view contains the Remote Frame Filter Table which provides the filtering information for SNA frames received from DLS participating routers other than those from local LAN segments (which are described in the Local SNA Frame Filter View). The fields are identical to those in the Local SNA Frame Filter View described earlier.

Remote NetBIOS Filter View

To access: Click on the **Remote Name Filter Table** button in the DLSw Information View. This view provides the filtering information for NetBIOS frames received from DLS participating routers other than those from local LAN segments (which are described in the Local NetBIOS Filter View). The fields are identical to those in the Local NetBIOS Filter View described earlier.

SNA Default Destination View

To access: Click on the **SNA Default Dest Table** button in the DLSw Information View. This view contains the table of default routers for MAC addresses.

DestAddress	The destination address for which the corresponding RouterIpAddr is applied.
RouterIpAddr	The default router used to reach the destination address in the DestAddress field.

NetBIOS Default Destination View

To access: Click on the **NetBIOS Default Dest Table** button in the DLSw Information View. This view contains the table of default routers for NetBIOS names.

DestName	The destination NetBIOS name for which the corresponding RouterIpAddr is applied.
RouterIpAddr	The default router used to reach the destination name in the DestName field.

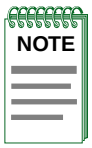
Circuit Diagnostic View

To access: Click on the **Circuit Diagnostics** button in the DLSw Information View. This view contains the Diagnostic/Error Table which provides the following information.

IfIndex	The interface supporting this circuit.
SourceAddr	The MAC address of the source of this circuit.
SourceSAP	The SAP identifier of the source of this circuit.
DestAddress	The MAC address of the destination of this circuit.
DestSAP	The SAP identifier of the destination of this circuit.
LLTstCmdsSent	The number of test commands sent by the local link station using by this circuit.
LLTstCmdsFail	The number of test commands failed by the local link station using by this circuit.

Circuit Diagnostic View (Continued)

LLTstCmdsRcv	The number of test commands received by the local link station using this circuit.
LLInvPktRcv	The number of invalid packets received by the local link station using this circuit.
LLAdpRcvErr	The number of data-detected receive errors by the local link station using this circuit.
LLAdpSndErr	The number of data-detected transmit errors by the local link station using this circuit.



A circuit is a logical connection between two end devices. A circuit is uniquely identified by a port number (on a specific router), source address, source SAP, destination address and destination SAP. In this case, the IfIndex is used instead of a port number.

Poll and Status View

To access: Click on the **Poll and Status Information** button in the DLSw Information View. This view contains the table of information on DLS circuits active on this router.

IfIndex	The interface supporting this circuit.
SourceAddr	The MAC address of the source of this circuit.
SourceSAP	The SAP identifier of the source of this circuit.

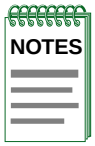
Poll and Status View (Continued)

DestAddress	The MAC address of the destination of this circuit.
DestSAP	The SAP identifier of the destination of this circuit.
PrtnrRtrAddr	The IP address of the partner router (remote IBM 6611) used by this circuit.
LocLnkState	The state of the local link station used by this circuit: Opening, Opened, Closing or Inactive.
LocLnkSubState	The sub-state of the local link station used by this circuit: Calling, Listening, Contacted, LocalBusy or RemoteBusy.
LocLnkRouting	The routing information used by the local link portion of this circuit. This field contains a 2-byte routing control field and up to eight 2-byte roue designators. For more information, refer to the Routing Information Field section of the IBM Token-Ring Network: Architecture Reference (SC30-3374).
LLRxInactTmouts	The number of inactivity timeouts received by the local link station used by this circuit.
LLCmdPollsSnt	The number of command polls sent by the local link station used by this circuit.
LLCmdRePollSnt	The number of command repolls sent by the local link station used by this circuit.
LLCmdContRePoll	The number of continuous repolls by the local link station used by this circuit.

Circuit Data Transfer View

To access: Click on the **Data Transfer Information** button in the DLSw Information View. This view contains the Circuit Data Table with the following information.

IfIndex	The interface supporting this circuit.
SourceAddr	The MAC address of the source of this circuit.
SourceSAP	The SAP identifier of the source of this circuit.
DestAddress	The MAC address of the destination of this circuit.
DestSAP	The SAP identifier of the destination of this circuit.
LLDatPktSent	The number of sequenced data packets sent by the local link station used by this circuit.
LLDatPktReSent	The number of sequenced data packets resent by the local link station used by this circuit.
LLMaxContSent	The maximum number of contiguous resendings by the local link station used by this circuit.
LLDatPktRcv	The number of sequenced data packets received by the local link station used by this circuit.



A unique circuit is identified by a port number (on a specific router), source address, source SAP, destination address and destination SAP. In this case, the IfIndex is used instead of a port number.

Each entry in the table described one circuit.

Chapter 9

APPN Application

Advanced Peer-to-Peer Networking (APPN) is a significant extension to IBM's Systems Network Architecture (SNA).

APPN builds upon the strengths of traditional SNA networks, which include reliability, predictability and performance, and adds the necessary network functions to aid the construction of complex networks of peer SNA nodes.

The APPN protocol utilizes a client-server architecture that distributes network control functions between an APPN end node (the client) and a network node (the server). While end nodes provide network access to end users, network nodes comprise the APPN network backbone. Network nodes provide topology management, resource management, optimized routing, and network management to end nodes. This approach significantly reduces the need for network definitions, easing network growth and simplifying network maintenance.

There are two APPN applications:

- APPN (ibmAPPNApp)
- APPN Session (AppnSessApp)

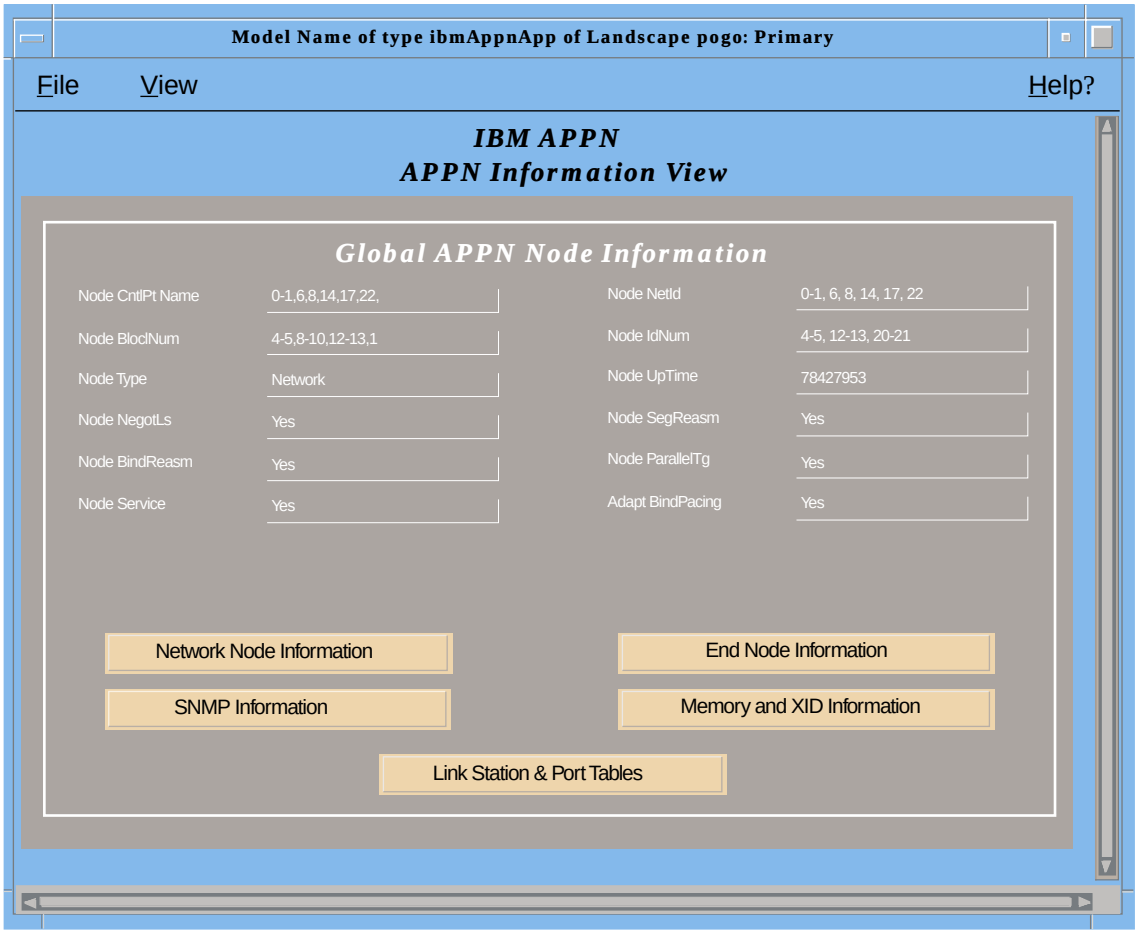
APPN Views

Five application-specific subviews are available for the APPN application from the ibmAppnApp icon:

- Configuration, which displays the APPN Information View.
- APPN Topology, which displays the Global Topology View.
- Class of Service, which leads to Class of Service Tables View.
- Directory Info, which displays the Directory Performance View.
- Local Topology, which displays the APPN Local Topology Information View.

A variety of other informational views are accessed from buttons contained within these views, and are described in the following pages. Figure 9-1 shows the first APPN subview available from the ibmAppnApp icon, the APPN Information View.

Figure 9-1. APPN Information View



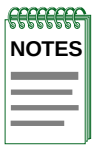
APPN Information View

To access: Select **Configuration** from the Icon Subviews menu. This view contains twelve fields and five buttons leading to more detailed views. The twelve fields provide global information for APPN nodes that applies to both network nodes and end nodes.

Node CntlPtName	The administratively assigned network CP (control point) name for this node in the format NETID.CPNAME.
Node NetId	The administratively assigned APPN network identification, one to eight characters long. This identifier is used together with the control point name to create a fully qualified control point name.
Node BlockNum	The block number, which is the first three digits of the node id. These hex digits identify the product and are not configurable.
Node IdNum	The last five digits of the node id. These five Hex digits are administratively assigned and combined with the Node BlockNum to provide the node id. This id is used to identify the local node and is included in XIDs (eXchange IDentifiers) and APPN alerts. A unique node id is required for connections to SNA sub-area.
Node Type	The type of APPN node; NetworkNode, EndNode or a LEN (Low Entry Network) end node.
Node UpTime	The time, in hundredths of a second, since this APPN node was initialized.
Node NegotLs	This field indicates whether the node supports negotiable link stations.
Node SegReasm	This field indicates whether the node supports segment reassembly. Segment reassembly is only supported when segment generation is also supported.
Node BindReasm	This field indicates whether the node supports bind segment reassembly. Bind segment reassembly is only supported when Bind segment generation is also supported.
Node ParallelTg	This field indicates whether the node supports parallel TGs (Transmission Groups).

APPN Information View (Continued)

Node Service	This field indicates whether the node allows call-in from nodes not defined locally.
Adapt BindPacing	This field indicates whether the node supports adaptive bind pacing.
Network Node Info	Clicking on the Network Node Information button displays the Network Node View described later in this section.
End Node Info	Clicking on the End Node Information button displays the End Node View described later in this section.
SNMP Information	Clicking on the SNMP Information button displays the SNMP Information View described later in this section.
Memory & XID Info	Clicking on the Memory & XID Information button displays the Memory & XID Information View described later in this section.
Link Station&Port	Clicking on the Link Station & Port Tables button displays the Link Station & Port Information View, which contains eight buttons each leading to a table.



A Transmission Group (TG) corresponds to a connection with a single adjacent link station. When more than one TG connects two adjacent nodes, they are known as parallel TGs.

TG characteristics are stored in the Topology Database.

Network Node View

To access:	Click on the **Network Node Information** button in the APPN Information View. This view contains global information about the APPN network node.
Rcv Registered Char	Indicates whether the node supports receiving registered characteristics.
Gateway Node	Indicates whether the node is a gateway node.
Central Dir Cache	Indicates whether the node supports central directory cache.
Route Tree Cache	Indicates whether the node supports route tree cache.
Increm Tree Update	Indicates whether the node supports incremental tree-update. (This can only be supported if tree caching is supported.)
Route Addn Resist	Route addition resistance is a value that indicates the relative desirability of using this node for intermediate session traffic. The value (0 through 255), is used in route computation. The lower the value, the more desirable the node is for intermediate routing.
Int Session Routing	Indicates whether the node supports intermediate session routing or not.
Flow Reduc Seq Num	Flow Reduction Sequence Numbers (FRSNs) are associated with Topology Database Updates (TDUs) and are unique only within each APPN network node. A TDU can be associated with several APPN resources. This field shows the last FRSN sent in a topology update to adjacent network nodes.

End Node View

To access: Click on the **End Node Information** button in the APPN Information View. This view contains the following information for the end node.

Segment Generation	Indicates whether the end node supports segment generation.
Mode-COS Mapping	Indicates whether the end node supports mode-name to COS-name mapping.
Locate Cdinit	Indicates whether the end node supports Locate Cdinit.
Snd Register Names	Indicates whether the node will register its LUs with the adjacent serving network node; Yes (register names) or No (do not register).
Snd Register Chars	Indicates whether the node supports send register characteristics. This can only be supported when Snd Register Names is supported (Yes).

SNMP Information View

To access: Click on the **SNMP Information** button in the APPN Information View. This view contains the following SNMP performance information.

SNMP Packets In	The number of messages delivered to the APPN SNMP sub-agent
Get Requests In	The number of GET requests delivered to the APPN SNMP sub-agent.
GetNexts In	The number of GETNEXT requests delivered to the APPN SNMP sub-agent.
Set Requests In	The number of SET requests delivered to the APPN SNMP sub-agent.

SNMP Information View (Continued)

Total VARIABLES In	The number of VARIABLES included in both GET and GETNEXT requests delivered to the APPN SNMP sub-agent.
Get VARIABLES In	The number of VARIABLES included in all GET requests delivered to the APPN SNMP sub-agent.
GetNxt VARIABLES In	The number of VARIABLES in GETNEXT requests delivered to the APPN SNMP sub-agent.
Set VARIABLES In	The number of VARIABLES in SET requests delivered to the APPN SNMP sub-agent.
NoSuchNames Out	The number of VARIABLES that could not be found by the APPN SNMP sub-agent.
GenErrs Out	The number of undefined errors that occurred processing SNMP requests to the APPN SNMP sub-agent.

Memory & XID Information View

To access:	Click on the **Memory & XID Information** button in the APPN Information View. This view contains two tables, the Control Point Storage Utilization Table and the Exchange Identifier (XID) Information Table, which provide the following information.
Control Point Storage Utilization Table	Provides information on specific storage allocation.
Shared Memory Size	The size of the shared storage segment, as obtained by storage management from the underlying operating system.
NumBytes Allocated	The number of bytes in the segment that are currently allocated to process.

Memory & XID Information View (Continued)

Allocation Threshold	The allocation threshold above which the storage management considers the storage resources to be constrained.
Critical Threshold	The allocation threshold above which the storage management considers the storage resources to be critically constrained.
Exchange Identifier XID Information Table	This table shows the counters, maintained by the APPN CS component, that relate to overall exchange identifier activity.
DefLnk Good XIDs	The current number of successful XIDs that have occurred on all defined link stations since the last time this node was initialized.
DefLnk Bad XIDs	The current number of unsuccessful XIDs that have occurred on all defined link stations since the last time this node was initialized.
DynamLnk Good XIDs	The current number of successful XIDs that have occurred on all dynamic link stations since the last time this node was initialized. (Dynamic link stations are created when adjacent nodes that have not been locally defined establish a connection with this node.)
DynamLnk Bad XIDs	The current number of unsuccessful XIDs that have occurred on all dynamic link stations since the last time this node was initialized.

Link Station & Port Information View

To access: Click on the **Link Station & Port Tables** button in the APPN Information View. This view contains ten buttons in two groups, Node Port Information and Link Station Information, leading to more detailed tables.

Node Port Information	Provides five buttons that lead to tables containing node port information.
Node Port Table	Clicking on the Node Port Table button displays the Node Port View described later in this section.
Node Port IP Table	Clicking on the Node Port IP Table button displays the Node Port IP View described later in this section.
DLS-specific Port Table	Clicking on the DLS-specific Port Table button displays the Node Port DLS View described later in this section.
Token Ring Port Table	Clicking on the Token Ring Port Table button displays the Node Port Token Ring View described later in this section.
Port DLC Trace Table	Clicking on the Port DLC Trace Table button opens the APPN Node Port DLC Trace View described later in this section.
Link Station Information	Provides five buttons that lead to tables containing link station information.
LS Node Tables	Clicking on the LS Node Table button displays the Node Link Station View described later in this section.
LS Node IP Table	Clicking on the LS Node IP Table button displays the Node Link Station IP View described later in this section.

Link Station & Port Information View (Continued)

LS Node DLS Table	Clicking on the LS Node DLS Table button displays the Node Link Station DLS View described later in this section.
LS Node Token Ring Table	Clicking on the LS Node Token Ring Table button displays the Node Link Station TokenRing View described later in this section.
LS Status and Exceptions Table	Clicking on the LS Status and Exceptions Table button opens the APPN Node Link Status/Error View described later in this section.

Node Port View

To access: Click on the **Node Port Table** button in the Link Station & Port Information View. The Node Port Table describes the configuration and current status of the ports used by APPN. The type of DLC (Data Link Control protocol) is included in the table as a pointer to the DLC port-specific tables.

NdPortName	The administratively assigned name for this APPN port (up to 8 characters).	
NdPorState	The current state of this port:	
	Inactive	The node is disabled
	Pendactive	Node activation is in progress
	Active	The node is enabled
	Pendinact	Node deactivation is in progress.

Node Port View (Continued)

NdPrtDlcType	The type of DLC interface, according to the protocol immediately “below” this layer; Other (none of the following), SDLC, DLS, Socket, Ethernet or Token Ring.
NdPrtPortType	The type of line used by this port; Leased, Switched or SharedAccessFacilities.
NdPrtSIMRIM	This field indicates whether the Set Initialization Mode (SIM) and Receive Initialization Mode (RIM) are supported.
NdPrtLsRole	The initial role for Link Stations activated through this port; Primary, Secondary, Negotiable or ABM (Asynchronous Balance Mode).
NdPrtRxBTU	The maximum Basic Transmission Size (BTU) that a link station on this port can receive.
MaxIFrmWin	The maximum number of I-frames that can be received by the XID sender before an acknowledgment is received.
DefLsGoodXIds	The number of successful XIDs that have occurred on all defined link stations on this port since it was last restarted.
DefLsBadXIDs	The number of unsuccessful XIDs that have occurred on all defined link stations on this port since it was last restarted.
DynLsGoodXIds	The number of successful XIDs that have occurred on all dynamic link stations on this port since it was last restarted.
DynLsBadXIds	The number of unsuccessful XIDs that have occurred on all dynamic link stations on this port since it was last restarted.
Port Specific	The port-specific object identifier which can provide additional information.

Node Port IP View

To access:	Click on the **Node Port IP Table** button in the Link Station & Port Information View. This view displays the following information in the Node Port IP Table (the TCP/IP-specific table).
PortIpName	The administratively assigned name for this port (up to 8 characters). Also the index for the table.
PortIpPortNum	The local TCP/IP port number of this port.

Node Port DLS View

To access:	Click on the **DLS-specific Port Table** button in the Link Station & Port Information View. This view displays the following information in the Node Port DLS Table.
PortDlsName	The administratively assigned name for this port (up to 8 characters). Also the index for the table.
PortDlsMac	The local DLS MAC address.
PortDlsSap	The local DLS Sap address.

Node Port Token Ring View

To access: Click on the **Token Ring Port Table** button in the Link Station & Port Information View. This view displays the following information in the Node Port TR Table.

PortTrName	The administratively assigned name for this port (up to 8 characters). Also the index for the table.
PortTrMac	The local Token Ring MAC address.
PortTrSap	The local Token Ring SAP address.

Node Port DLC Trace View

To access: Click on the **Port DLC Trace Table** button in the Link Station and Port Information View. This view displays the following information in the Port DLC Trace Table.

TracePortName	The port name associated with this trace table entry.
TraceIndex	This index value is updated every time a new trace entry is created. It provides a means to retrieve only the updated entries and also is a simple method of correlating the entries. The table will wrap when full, which will result in the previous entries being written over. The management station can overcome this by retrieving the table using this index to retrieve only the new table entries.
TraceDlcType	The type of DLC interface, distinguished according to the protocol immediately below this layer.

Node Port DLC Trace View (Continued)

LocalAddress	The local address in the format described below: other = free form DisplayString ip = 1d.1d.1d.1d/2d tr = 1x:1x:1x:1x:1x:1x:1x dlsw = 1x:1x:1x:1x:1x:1x:1x ethernet = 1x:1x:1x:1x:1x:1x:1x
RemoteAddress	The remote address in the formats described below: other = free form DisplayString ip = 1d.1d.1d.1d/2d tr = 1x:1x:1x:1x:1x:1x:1x dlsw = 1x:1x:1x:1x:1x:1x:1x ethernet = 1x:1x:1x:1x:1x:1x:1x
TraceMsgType	Indicates the type of trace record entry.
TraceCmdType	Indicates the command type of the trace entry.
TraceUseWAN	Indicates the type of connection of the trace entry. For example, a token ring and ethernet port will have useLan as the connection. For the dls port, it could be either useWan of connection is across Wan via dls sessions, or useLan if connection is to a local attached Lan.

Node Link Station View

To access: Click on the **LS Node Tables** button in the Link Station & Port Information View. The Node Link Station Tables contain three buttons leading to further views and detailed information about the link station configuration.

Node Link Station General Info	Clicking this button opens the APPN Node Link Station General View, which contains two fields: General & Common LS Info, and LS_Defined Data/Xid Info. The information in these fields is detailed below.
General & Common LS Info	This table contains the link station information defined below.
LsName	The administratively assigned name for this link station (up to 8 characters). Also the index for the table.
LsPortName	The administratively assigned name for the port (up to 8 characters).
LsDlcType	The type of DLC interface, according to the protocol immediately "below" this layer; Other (none of the following), SDLC, DLS, Socket, Ethernet or Token Ring.
LsDynamic	Whether this is a dynamic link station (Yes) or not. Dynamic link stations are created when adjacent nodes that have not been locally defined establish a connection with this node.
LsState	The current state of this link station: Inactive — The station is disabled Pendactive — Activation is in progress Active — The station is enabled Pendinact — Deactivation is in progress.

Node Link Station View (Continued)

TgtPaceCnt	A value between zero and 32767 inclusive indicating the desired pacing window size for BINDs on this TG. The number is significant only when fixed bind pacing is being performed.
MaxSndBTU	An administratively assigned value between zero and 32767 inclusive indicating the desired number of bytes in a Basic Transmission Unit (BTU) sent on this TG.
LS_Defined Data/Xid Info	This table contains the link information defined below.
LsCpName	The fully-qualified name of the adjacent node for this link station. The name can be from three to 17 characters in the format NETID.CPNAME.
LsTgNumber	The number associated with the TG to this link station.
LsLimResrce	Whether the link station is a limited resource (Yes) or not. If it is, the TG is deactivated when here are no sessions.
LsMigration	Whether this station will be used for connections to down-level or migration partners (Yes) or not.
LsBlockNum	The block number, which is the first three digits of the node id. These Hex digits identify the product and are not configurable.
LsIdNum	The last five digits of the node id. These five Hex digits are administratively assigned and combined with the Node BlockNum to provide the node id. This id is used to identify the local node and is included in XIDs and APPN alerts. A unique node id is required for connections to SNA sub-area.
LsCpCpSess	Whether CP-CP (Control Point to Control Point) sessions are supported by this link station (Yes) or not.
TG and DLC-specific Tables	Clicking this button opens the APPN Node Link Station TG/DLC View, which contains two fields: TG Characteristics and DLS-specific Information. The information in these fields is detailed below.
TG Characteristics	This table contains the information defined below.

Node Link Station View (Continued)

LsName	The administratively assigned name for this link station.
EffectCapa	The effective capacity (integer between 0 and 603,979,776) that indicates the kilobits per second. It is derived from the link bandwidth and maximum load factor. This is an administratively assigned value associated with the TG using this link station.
ConnCost	The cost per connect time (0 through 255), representing the relative cost per unit of time to use the TG. A value of zero indicates no cost; 255 is the maximum cost. This is an administratively assigned value associated with the TG using this link station.
ByteCost	The relative cost of transmitting a byte over this link; from 0 (lowest cost) to 255. This is an administratively assigned value associated with the TG using this link station.
LsSecurity	The security is represented as an integer with a range of 1 through 255. This is an administratively assigned value associated with the TG using this link station. The most common values are represented as follows: 1 NonSecure 32 PublicSwitchedNetwork 64 UndergroundCable 96 SecureConduit 128 GuardedConduit 160 Encrypted 192 GuardedRadiation

Node Link Station View (Continued)

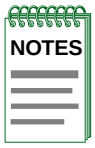
LsDelay	The amount of time, in microseconds, that it takes the signal to travel the length of the logical link. This is an administratively assigned value associated with the TG using this link station. The most common values are represented as follows: 0 Minimum 384 Negligible 9216 Terrestrial 147456 Packet 294912 Long 2013265920 Maximum
LsUsr1/2/3	First/second/third user-defined TG characteristic for this TG (0 through 255). This is an administratively assigned value associated with the TG using this link station.
DLS-specific Information	This table contains the information defined below.
LsName	The administratively assigned name for this link station.
LsSpecific	The DLC-specific object identifier that can provide additional information.
SubState	The state of this link station.
StartTime	The time (in hundredths of a second) this link station has been active since the last time the time APPN was initialized.
ActiveTime	The time (in hundredths of a second) this link station has been in the active state. A zero value indicates the link station has never been active.
CurrStateTime	The time (in hundredths of a second) the link station is in the current state.
Performance and Statistics	Clicking on this button opens the APPN Link Station Performance/Stats View, which contains two fields: Performance Data and Prop Delay/Xid Stats. The information in these fields is detailed below.

Node Link Station View (Continued)

Performance Data	This table contains the information defined below.
InXidBytes	The number of XID bytes received.
InMsgBytes	The number of message (I-frame) bytes received.
InXidFrames	The number of XID frames received.
InMsgFrames	The number of message (I-frame) frames received.
OutXidBytes	The number of XID bytes sent.
OutMsgBytes	The number of message (I-frame) bytes sent.
OutXidFrames	The number of XID frames sent.
OutMsgFrames	The number of message (I-frame) frames sent.
Prop Delay/Xid Stats	This table contains the information defined below.
EchoResps	The number of responses returned from adjacent link stations. (A response should be returned for each test frame sent.)
CurrDelay	The time, in milliseconds, taken for the last test signal to be sent and returned from this link station to the adjacent link station.
MaxDelay	The longest time, in milliseconds, it took for a test signal to be sent and returned from this link station to the adjacent link station.
MinDelay	The shortest time, in milliseconds, it took for a test signal to be sent and returned from this link station to the adjacent link station.
MaxDlyTime	The time, in hundredths of a second, since the station was last reset at which the MaxDelay occurred.

Node Link Station View (Continued)

LsGoodXids	The number of successful XIDs that have occurred on this link station since it was started.
LsBadXids	The number of unsuccessful XIDs that have occurred on this link station since it was started.



Test frames are sent to adjacent nodes periodically to verify connectivity and to measure the actual round trip time (from the time the test frame is sent until the response is received).

Node Link Station IP View

To access: Click on the **LS Node IP Table** button in the Link Station & Port Information View. This view displays the following information in the Node Link Station IP Table.

LsIpName	The administratively assigned name for this link station (up to 8 characters). Also the index for the table.
LsIpState	The current state of this link station: Inactive — The station is disabled Pendactive — Activation is in progress Active — The station is enabled Pendinact — Deactivation is in progress.
LsLocalIpAddr	The local IP address. This is 0.0.0.0 when the station is not active.

Node Link Station IP View (Continued)

LsLocIpPrtNo	The local TCP/IP port number. The default listening port is administratively assigned and will change dynamically if this node initiates a session with an adjacent node.
LsRemoteIpAddr	The remote IP address.
LsRemIpPrtNo	The remote TCP/IP port number.

Node Link Station DLS View

To access: Click on the **LS Node DLS Table** button in the Link Station & Port Information View. This view displays the following information in the Node LS DLS Table.

LsDlsName	The administratively assigned name for this link station (up to 8 characters). Also the index for the table.
LsDlsState	The current state of this link station: Inactive — The station is disabled Pendactive — Activation is in progress Active — The station is enabled Pendinact — Deactivation is in progress.
LsLocalDlsMac	The local MAC address.
LsLocDlsSap	The local SAP address.
LsRemDlsMac	The remote MAC address.
LsRemDlsSap	The remote SAP address.

Node Link Station TokenRing View

To access: Click on the **LS Node Token Ring Table** button in the Link Station & Port Information View. This view displays the following information in the Node LS TR Table.

LsTrName	The administratively assigned name for this link station (up to 8 characters). Also the index for the table.
LsTrState	The current state of this station: Inactive — The station is disabled. Pendactive — Activation is in progress. Active — The station is enabled. Pendinact — Deactivation is in progress.
LsLocalTrMac	The local MAC address.
LsLocTrSap	The local SAP address.
LsRemTrMac	The remote MAC address.
LsRemTrSap	The remote SAP address.

APPN Node Link Status/Error View

To access: Click on the **LS Status & Exceptions Table** button in the Link Station and Port Information view. This view displays the following information in the Node Link Station Status Table.

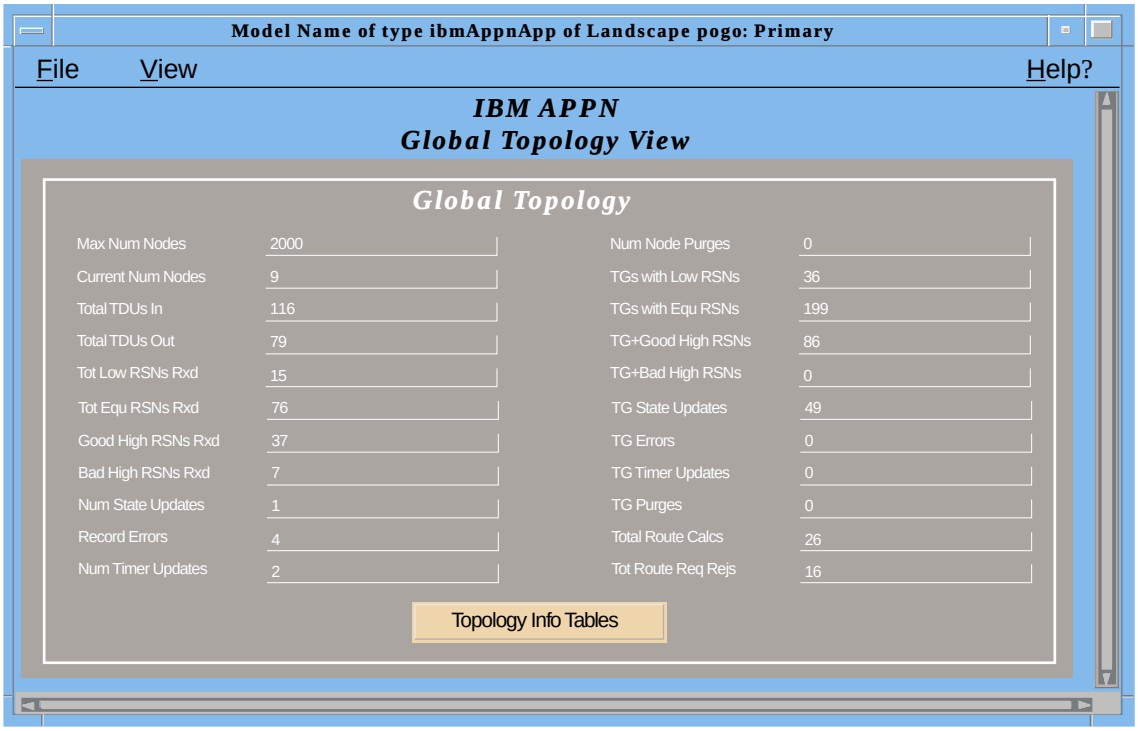
StatusIndex	The continuous index to this table. The value of the index begins at zero and is incremented up to a maximum value of 2**31-1 (2,147,483,647) before wrapping.
StatusTime	Time, in hundredths of a second, since this node was last initialized.
StatusLsName	The administratively-assigned name for this link station.
StatusCpName	The administratively-assigned, fully qualified name of the adjacent node partner. This will be provided when the adjacent node has been defined at this node or when the XID sequence has proceeded far enough to identify the adjacent node. A blank CP name will indicate the name is unknown.
NodeId	The adjacent node Id.
TgNum	The number associated with the TG to this link station with a range from 0 to 256. A value of 256 indicates the TG number has not been negotiated and is unknown at this time.
GeneralSense	The error sense code associated with the start sequence of activation of a link up to the beginning of the XID sequence.
NOFRetry	Indicates whether Node Operator Facility (NOF) will retry the start request to activate the link.
EndSense	The sense code associated with the termination of the link connection to the adjacent node. This includes all sense information included in the disconnect received from the lower layer DLCs and also sense information indicating the link termination originated by upper layer APPN components.
XidLocalSense	The error sense code associated with the rejection of the XID.

APPN Node Link Status/Error View (Continued)

XidRemoteSense	The error sense code adjacent node returned to this node indicating the reason the XID was rejected.
XidByteInErr	Identifies the actual byte in the XID that caused the error. The value of zero (0) indicates that the variable has no meaning.
XidBitInErr	Identifies the actual bit within the error byte of the XID. This only has meaning when the byte in error is greater than zero.
DlcType	Identifies the DLC type that was being used when the error occurred. This also is used to the format of the local and remote address provided.The possible types and their formats are described below: other = free form DisplayString ip = 1d.1d.1d.1d/2d tr = 1x:1x:1x:1x:1x:1x:1x dlsw = 1x:1x:1x:1x:1x:1x:1x ethernet = 1x:1x:1x:1x:1x:1x:1x
LocalAddress	This contains a displayable string that identifies the DLC type and appropriate address. (See DLC type above for details on the format.)
RemoteAddress	This contains a displayable string that identifies the DLC type and appropriate address. (See DLC type above for details on the format.)

Figure 9-2 shows the APPN Global Topology View with its associated fields and button.

Figure 9-2. APPN Global Topology View



APPN Global Topology View

To access: Select **APPN Topology** from the Icon Subviews menu. This view contains several fields and one button leading to a "menu" of six topology tables. Together, these tables describe the complete APPN network topology, including network nodes, virtual nodes and all TGs associated with these nodes.

Max Num Nodes	The maximum number of nodes allowed in the APPN topology database. This administratively assigned value must be greater than the sum of the maximum number of end nodes and network nodes. If the number of nodes exceeds that value in this field, APPN issues an alert and the node can no longer participate as a network node.

APPN Global Topology View (Continued)

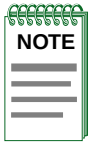
Curr Num Nodes	The number of nodes currently in this node's topology database. If this value exceeds the maximum number of nodes allowed (the value in Max Num Nodes), APPN issues the CPDB002 alert.
Total TDUs In	The number of TDUs received from all adjacent network nodes since the last initialization.
Total TDUs Out	The number of TDUs built by this node to be sent to all adjacent network nodes since the last initialization.
Tot Low RSNs Rxd	The number of topology node updates received by this node with an RSN (Resource Sequence Number) less than the current RSN. Both even and odd RSNs are included. These TDUs are not errors, but result when TDUs are broadcast to all adjacent network nodes. This node's topology database is not updated, but the node sends a TDU with it's higher RSN to the adjacent node that sent this low RSN.
Tot Equ RSNs Rxd	The number of topology node updates received by this node with an RSN equal to the current RSN. Both even and odd RSNs are included. These TDUs are not errors, but result when TDUs are broadcast to all adjacent network nodes. This node's topology database is not updated.
Good High RSNs Rxd	The number of topology node updates received by this node with an RSN greater than the current RSN. This node's topology database is updated and the node broadcasts a TDU to all adjacent network nodes.
Bad High RSNs Rxd	The number of topology node updates received by this node with an odd RSN greater than the current RSN. These updates represent a topology inconsistency detected by one of the APPN network nodes. This node's topology database is updated and the node broadcasts a TDU to all adjacent network nodes.
Num State Updates	The number of topology node records built as a result of internally detected node state changes that affect APPN topology and routing. Updates are sent via TDUs to all adjacent nodes.
Record Errors	The number of topology node record inconsistencies detected by this node. This occurs when the node attempts to update its topology database and detects a data inconsistency. The node then creates a TDU with the current RSN incremented to the next odd number and broadcasts it to all adjacent network nodes.

APPN Global Topology View (Continued)

Num Timer Updates	The number of topology node records built for this node's resource due to timer updates. Updates are sent via TDUs to all adjacent network nodes. These updates ensure other network nodes do not delete these resources from their topology databases.
Num Node Purges	The number of topology node records purged from this node's topology database. Purges occur when a node has not been updated during a specified time span. The owning node is responsible for broadcasting updates for those of its resources that it wants to be kept in the network topology.
TGs with Low RSNs	The number of topology TG updates received by this node with an RSN less than the current RSN. Both even and odd RSNs are included in this count. These TDUs are not errors but result when TDUs are broadcast to all adjacent network nodes. This node's topology database is not updated, but it sends a TDU with its higher RSN to the sender of the low RSN.
TGs with Equ RSNs	The number of topology TG updates received by this node with an RSN equal to the current RSN. Both even and odd RSNs are included in this count. These TDUs are not errors but result when TDUs are broadcast to all adjacent network nodes. This node's topology database is not updated.
TG+Good High RSNs	The number of topology TG updates received by this node with an RSN greater than the current RSN. This node's topology database is updated and a broadcast sent to all adjacent network nodes.
TG+Bad High RSNs	The number of topology TG updates received by this node with an odd RSN greater than the current RSN. These updates represent a topology inconsistency detected by one of the APPN network nodes. This node's topology database is updated and a TDU broadcast to all adjacent network nodes.
TG State Updates	The number of topology TG records built as a result of internally detected node state changes that affect APPN topology and routing. Updates are sent via TDUs to all adjacent nodes.
TG Errors	The number of topology TG record inconsistencies detected by this node. This occurs when the node attempts to update its topology database and detects a data inconsistency. The node then creates a TDU with the current RSN incremented to the next odd number and broadcasts it to all adjacent network nodes.

APPN Global Topology View (Continued)

TG Timer Updates	The number of topology TG records built for this node's resource due to timer updates. Updates are sent via TDUs to all adjacent network nodes. These updates ensure other network nodes do not delete these resources from their topology databases.
TG Purges	The number of topology TG records purged from this node's topology database. Purges occur when a TG has not been updated during a specified time span. The owning node is responsible for broadcasting updates for those of its resources that it wants to be kept in the network topology.
Total Route Calcs	The number of routes calculated for all Class of Services since the last initialization.
Tot Route Req Rejs	The number of route requests for all Class of Services that could not be calculated since the last initialization.
Topology Info Tables	Clicking on the Topology Info Tables button displays the Node Topology Tables View.



Each network node maintains information about all network nodes and all intermediate routing TGs within the APPN network in a database called the Network Topology Database. It does not include information on LEN end nodes, APPN end nodes or the TGs attached to them. It does include data on network nodes and their connections to virtual routing nodes and other network nodes.

Node Topology Tables View

To access: Click on the **Topology Info Tables** button in the APPN Topology Information View. This view is a menu of buttons leading to more detailed topology tables.

Node Topology Route Table	Clicking on the Node Topology Route Table button displays the Topology Route View described later in this section.
Adjacent Node Table	Clicking on the Adjacent Node Table button displays the Adjacent Node View described later in this section.
Nwk & Virtual Node Topo Table	Clicking on the Network & Virtual Node Topo Table button displays the Topology Node View described later in this section.
Transmission Grp Topo Table	Clicking on the Transmission Grp Topo Table button displays the Transmission Group Topology Node View described later in this section.
FRSN Topology Node Table	Clicking on the FRSN Topology Node Table button displays the Flow Reduction Sequence Number Topology Node View described later in this section.
Txn Grp FRSN Topology Table	Clicking on the Txn Grp FRSN Topology Table button displays the Transmission Group FRSN Topology Node View described later in this section.

Topology Route View

To access:	Click on the **Node Topology Route Table** button in the Node Topology Tables View. This view contains an entry for every Class of Service that a route has been calculated for.
RtClassOfSrvc	The Class of Service for the route. Also the index for the table.
RtTreeCaches	The number of route tree caches built for this Class of Service since the last initialization.
RouteCalcs	The number of route calculated since the last initialization.
RouteRejs	The number of route requests that could not be calculated since the last initialization.

Adjacent Node View

To access: Click on the **Adjacent Node Table** button in the Node Topology Tables View. This view contains information about every adjacent node.

AdjNodeName	An administratively assigned fully-qualified name of the adjacent network node. Also the index for the table.	
CpCpSessStatus	The state of CP-CP sessions between this node and adjacent network and end nodes. Possible states are as follows:	
	Active	CP-CP sessions are active using both the ConWinner and ConLoser sessions.
	ConLoserActive	A session initiated by the adjacent node an is used by this node to receive from the adjacent node.
	ConWinnerActive	A session initiated by this node and used to send to the adjacent node.
	Inactive	No CP-CP sessions exist between this node and the adjacent node.
OutSeqTDUs	The number of Out Of Sequence TDUs. In a quiescent (dormant) state, this is zero. During normal operation, the value varies depending on the network environment.	
LastFrsnSnt	A TDU can be associated with multiple APPN resources and FRSNs are associated with TDUs. This field shows the last FRSN (and therefore indicates the last TDU) sent to this adjacent node. (FRSNs are unique only within each APPN network node and have a value 0 through 65535.)	
LastFrsnRxd	A TDU can be associated with multiple APPN resources and FRSNs are associated with TDUs. This field shows the last FRSN (and therefore indicates the last TDU) received from this adjacent node. (FRSNs are unique only within each APPN network node and have a value 0 through 65535.)	

Topology Node View

To access: Click on the **Nwk & Virtual Node Topo Table** button in the Node Topology Tables View. The Topology Node Table contains an entry for every APPN network node and Virtual node in the APPN network. Each entry occupies two lines; the NodeName is repeated on the second line.

NodeName	Administratively assigned network name that is locally defined at each network node. The name is in the format NETID.CPNAME and is the index for the table.
NodeFRSN	An FRSN indicating the last time this resource was updated at this node. (FRSNs are unique only within each APPN network node and have a value 0 through 65535.)
NdEntTimeLeft	The number of days left before this network node entry will be deleted (0 through 31).
NodeType	The type of APPN node; NetworkNode or VirtualNode.
NodeRSN	The Resource Sequence Number (RSN) that is assigned and controlled by the network node that owns this resource. Unless an error has occurred, the RSN is an even 32-bit number.
AddnResist	Addition resistance indicates the relative desirability of using this node for intermediate session traffic. The value in this field (0 through 255) is used in route computation. The lower the number, the more desirable the node.
NdCongested	Whether this node is congested (Yes) or not. When congestion exists, this node is not included in route selection by other nodes. (Congestion occurs when the number of ISR sessions exceeds an upper threshold established for effective APPN routing services. The status becomes uncongested, No, when the number of ISR sessions falls below the lower threshold.)
IsrDepleted	Whether ISR (Intermediate Session Routing) resources are depleted. When depleted (Yes), this node is not included in route selection by other nodes.
EndPtDeplete	Whether session End Point resources are depleted (Yes) or not.

Topology Node View (Continued)

NdQuiescing	Whether the node is quiescing (dormant) or not. When the node is quiescing (Yes), this node is not included in route selection by other nodes.
NdGateway	Whether the node provides gateway functions.
CentralDir	Whether the node acts as a central directory.
NodeISR	Whether the node supports ISR (Intermediate Session Routing).
ChainSupport	Whether the node supports chaining.

Transmission Group Topology Node View

To access:	Click on the **Transmission Grp Topo Table** button in the Node Topology Tables View. This view displays the portion of the APPN topology database that describes all of the APPN transmission groups (TGs) used by the APPN network nodes. (Each entry in the table takes three lines. In addition, the table has three indexes to uniquely define an entry. Therefore the first three fields are repeated on each line.)
TgOwner	An administratively assigned name for the originating node for this TG. The format is NETID.CPNAME and is the same as the name specified in the node table.
TgDestination	An administratively assigned fully-qualified network name for the destination node for this TG.
TgNumber	A number associated with this transmission group (0 through 255).

Transmission Group Topology Node View (Continued)

TgFRSN	A TDU can be associated with multiple APPN resources and FRSNs are associated with TDUs. This field shows the FRSN that indicates the last time this resource was updated at this node. (FRSNs are unique only within each APPN network node and have a value 0 through 65535.)
EntTimeLeft	The number of days left before this network node TG entry will be deleted (0 through 31).
TgDstVirt	Indicates whether the destination node is a virtual node.
TgDlcData	This field contains DLC specific data, related to the link connection network; TokenRing (MAC/SAP), X.25, X.21 or CircuitSwtch.
TgRSN	The current owning node's RSN (Resource Sequence Number) for this resource.
TgOptnl	Whether the transmission group is operational.
TgQuiescing	Whether the transmission group is quiescing (dormant).
TgCpCpSess	Whether CP-CP sessions are supported on this TG.
TgEffectCapa	The effective capacity (an integer) in kilo bits per second. This value is derived from the link bandwidth and the maximum load factor and has a range from 0 through 603,979,776. (This is an administratively assigned value associated with this TG.)
TgConnCost	The cost per connection time (0 through 255). This value represents the relative cost per unit time of using the TG. A value of 0 indicates no cost; 255 is the maximum cost. (This is an administratively assigned value associated with this TG.)
TgByteCost	The relative cost of transmitting one byte over this link from 0 (lowest cost) through 255 (maximum cost). (This is an administratively assigned value associated with this TG.)

Transmission Group Topology Node View (Continued)

TgSecurity	The security is represented as an integer with a range of 1 through 255. This is an administratively assigned value associated with this TG. The most common values are represented as follows: 1 NonSecure 32 PublicSwitchedNetwork 64 UndergroundCable 96 SecureConduit 128 GuardedConduit 160 Encrypted 192 GuardedRadiation
TgDelay	The amount of time, in microseconds, that it takes the signal to travel the length of the logical link. This is an administratively assigned value associated with this TG. The most common values are represented as follows: 0 Minimum 384 Negligible 9216 Terrestrial 147456 Packet 294912 Long 2013265920 Maximum
TgModemClass	This field allows multiple images for a connection network. If this entry is for a connection network, this field has the same value as in the TG vector. For non-connection networks, it is zero.
TgUsr1/2/3	First/second/third user-defined TG characteristic for this TG (0 through 255). This is an administratively assigned value associated with this TG.

Flow Reduction Sequence Number Topology Node View

To access: Click on the **FRSN Topology Node Table** button in the Node Topology Tables View. Each entry in the table occupies two lines; the FRName and NodeFRSN are repeated on the second line.

FRName	Administratively assigned network name that is locally defined at each network node. The name is in the format NETID.CPNAME and is the index for the table.
NodeFRSN	An FRSN indicating the last time this resource was updated at this node. (FRSNs are unique only within each APPN network node and have a value 0 through 65535.)
TimeLeft	The number of days left before this network node entry will be deleted (0 through 31).
FRType	The type of APPN node; NetworkNode or VirtualNode.
FRSeqNum	The Resource Sequence Number (RSN) that is assigned and controlled by the network node that owns this resource. Unless an error has occurred, the RSN is an even 32-bit number.
RtAddResist	Route addition resistance indicates the relative desirability of using this node for intermediate session traffic. The value in this field (0 through 255) is used in route computation. The lower the number, the more desirable the node.
FRNdCongested	Whether this node is congested (Yes) or not. When congestion exists, this node is not included in route selection by other nodes.
IsrDepleted	Whether ISR (Intermediate Session Routing) resources are depleted. When depleted (Yes), this node is not included in route selection by other nodes.
EndPtDeplete	Whether session End Point resources are depleted (Yes) or not.
Quiescing	Whether the node is quiescing (dormant) or not. When the node is quiescing (Yes), this node is not included in route selection by other nodes.
Gateway	Whether the node provides gateway functions.

Flow Reduction Sequence Number Topology Node View (Continued)

CentralDir	Whether the node acts as a central directory.
IntSessRtg	Whether the node supports Intermediate Session Routing (ISR).
ChainSupport	Whether the node supports chaining.

Transmission Group FRSN Topology Node View

To access: Click on the **Txn Grp FRSN Topology Table** button in the Node Topology Tables View. The table shows the part of the APPN database that describes all the APPN transmission groups used by the APPN network nodes. (Each entry in the table takes three lines. In addition, the table has four indexes to uniquely define an entry. Therefore the first four fields are repeated on each line.)

TgFROwner	An administratively assigned name for the originating node for this TG. The format is NETID.CPNAME and is the same as the name specified in the node table.
DestNwkName	An administratively assigned fully-qualified network name for the destination node for this TG.
TgFRNumb	The number associated with this transmission group (0 through 255).
TgFRFRSN	A TDU can be associated with multiple APPN resources and FRSNs are associated with TDUs. This field shows the FRSN that indicates the last time this resource was updated at this node. (FRSNs are unique only within each APPN network node and have a value 0 through 65535.)
TimeLeft	The number of days left before this network node TG entry will be deleted (0 through 31).

Transmission Group FRSN Topology Node View (Continued)

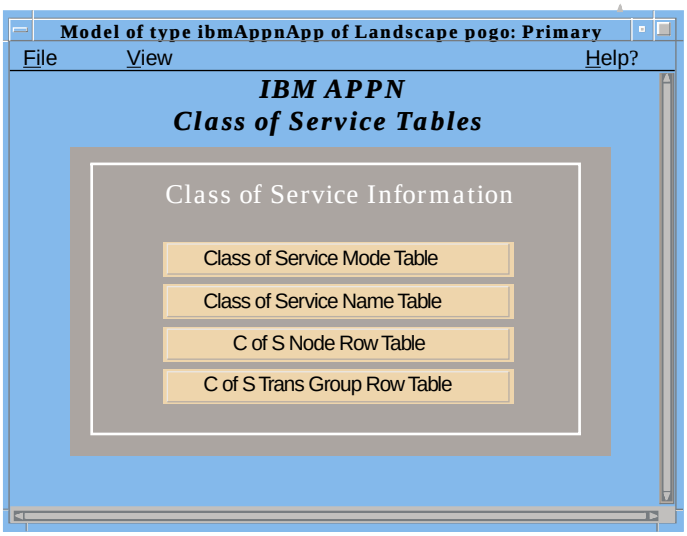
DestVirt	Indicates whether the destination node is a virtual node.
FRDlcData	This field contains DLC specific data, related to the link connection network; TokenRing (MAC/SAP), X.25, X.21 or CircuitSwtch.
TgFrResSeqNo	The current owning node's RSN (Resource Sequence Number) for this resource.
TgFrOptnl	Indicates whether the transmission group is operational.
Quiescing	Indicates whether the transmission group is quiescing (dormant).
CpCpSess	Indicates whether CP-CP sessions are supported on this TG.
EffectCapa	The effective capacity (an integer) in kilo bits pr second. This value is derived from the link bandwidth and the maximum load factor and has a range from 0 through 603,979,776. (This is an administratively assigned value associated with this TG.)
ConnCost	The cost per connection time (0 through 255). This value represents the relative cost per unit time of using the TG. A value of 0 indicates no cost; 255 is the maximum cost. (This is an administratively assigned value associated with this TG.)
ByteCost	The relative cost of transmitting one byte over this link from 0 (lowest cost) through 255 (maximum cost). (This is an administratively assigned value associated with this TG.)

Transmission Group FRSN Topology Node View (Continued)

Security	The security is represented as an integer with a range of 1 through 255. This is an administratively assigned value associated with this TG. The most common values are represented as follows: 1 NonSecure 32 PublicSwitchedNetwork 64 UndergroundCable 96 SecureConduit 128 GuardedConduit 160 Encrypted 192 GuardedRadiation
Delay	The amount of time, in microseconds, that it takes the signal to travel the length of the logical link. This is an administratively assigned value associated with this TG. The most common values are represented as follows: 0 Minimum 384 Negligible 9216 Terrestrial 147456 Packet 294912 Long 2013265920 Maximum
ModemClas	This field allows multiple images for a connection network. If this entry is for a connection network, this field has the same value as in the TG vector. For non-connection networks, it is zero.
TgFrUsr1/2/3	First/second/third user-defined TG characteristic for this TG (0 through 255). This is an administratively assigned value associated with this TG.

Figure 9-3 shows the Class of Service Tables View with its corresponding buttons.

Figure 9-3. Class of Service Tables View


Model of type ibmAppnApp of Landscape pogo: Primary
File
View
Help?
IBM APPN
Class of Service Tables
Class of Service Information
Class of Service Mode Table
Class of Service Name Table
C of S Node Row Table
C of S Trans Group Row Table

Class of Service Tables View

To access: Select **Class of Service** from the Icon Subviews menu. Class of Service is a means of expressing the quality of routes and the transmission priority of traffic which flows on these routes. The Class of Service Tables View is comprised of four buttons leading to more detailed tables. The tables are assigned administratively at each APPN node with default tables provided by IBM.

Class of Service Mode Table — Clicking on the Class of Service Mode button displays the Class of Service Mode View described later in this section.

Class of Service Name — Clicking on the Class of Service Name button displays the Class of Service Name View described later in this section.

Class of Service Tables View

C of S Node Row Table	Clicking on the C of S Node Row Table button displays the Class of Service Node Row View described later in this section.
C of S Trans Group Row Table	Clicking on the C of S Trans Group Row Table button displays the Class of Service Transmission Group Row View described later in this section.

Class of Service Mode View

To access:	Click on the **Class of Service Mode** button in the Class of Service Tables View. This view contains all of the defined mode names for this node and the matching Class of Service Name. Therefore, when a session is established, and a mode name specified, the Class of Service for that session is implied.
ModeName	The administratively assigned name for this mode.
ModeCOSName	The administratively assigned name for this Class of Service.

Class of Service Name View

To access:	Click the **Class of Service Name** button in the Class of Service Tables View. It contains all the defined Class of Services and their transmission priorities.
Name	The administratively assigned name for this Class of Service.
TransPriority	The transmission priority for this Class of Service: Low, Medium, High or Network.

Class of Service Node Row View

To access:	Click on the **C of S Node Row Table** button in the Class of Service Tables View. This view contains all node-row information for all Class of Services defined for this node. At least one node row must be specified; the default Class of Service tables specify eight rows. The index for this table comprises two fields; NodeRowName and NdRowIndex.
NodeRowName	The administratively assigned Class of Service name up to eight characters in length.
NdRowIndex	An index, unique for each Class of Service (0 through 255). This is the same index as used in the Class of Service Transmission Group Row table.
NdRowWeight	A weighting factor to be associated with the nodes that match the criteria specified by this node row.
ResistMin	The minimum route addition resistance value for this node (0 through 255). The lower the value, the more desirable the node for intermediate routing.
ResistMax	The maximum route addition resistance value for this node (0 through 255). The lower the value, the more desirable the node for intermediate routing.
LoCongstnAllow	Indicates whether low congestion will be tolerated.
HiCongstnAllow	Indicates whether high congestion will be tolerated.

Class of Service Transmission Group Row View

To access:	Click on the **C of S Trans Group Row Table** button in the Class of Service Tables View. This view contains all the transmission group row information for all Class of Services defined for this node. The first two field comprise the index for this table; RowName and RowIndex. At least one row must be specified; the default tables specify eight rows.
RowName	The administratively assigned Class of service name up to eight characters in length.
RowIndex	An index, unique for each Class of Service (0 through 255). This is the same index as used in the Class of Service Node Row table.
RowWeight	A weighting factor to be associated with the nodes that match the criteria specified by this transmission group row.
MinEffCapa	The minimum acceptable speed for this Class of Service expressed as an integer (0 through 603,979,776) in kilo bytes per second. This value is derived from the bandwidth and the maximum load factor.
MaxEffCapa	The maximum acceptable speed for this Class of Service expressed as an integer (0 through 603,979,776) in kilo bytes per second. This value is derived from the bandwidth and the maximum load factor.
MinConnCost	The minimum acceptable cost per connect time for this Class of Service, from 0 (no cost) through 255 (maximum cost). This is a relative cost per unit of time.
MaxConnCost	The maximum acceptable cost per connect time for this Class of Service, from 0 (no cost) through 255 (maximum cost). This is a relative cost per unit of time.
MinByteCost	The minimum acceptable cost per byte for this Class of Service (0 through 255).
MaxByteCost	The maximum acceptable cost per byte for this Class of Service (0 through 255).

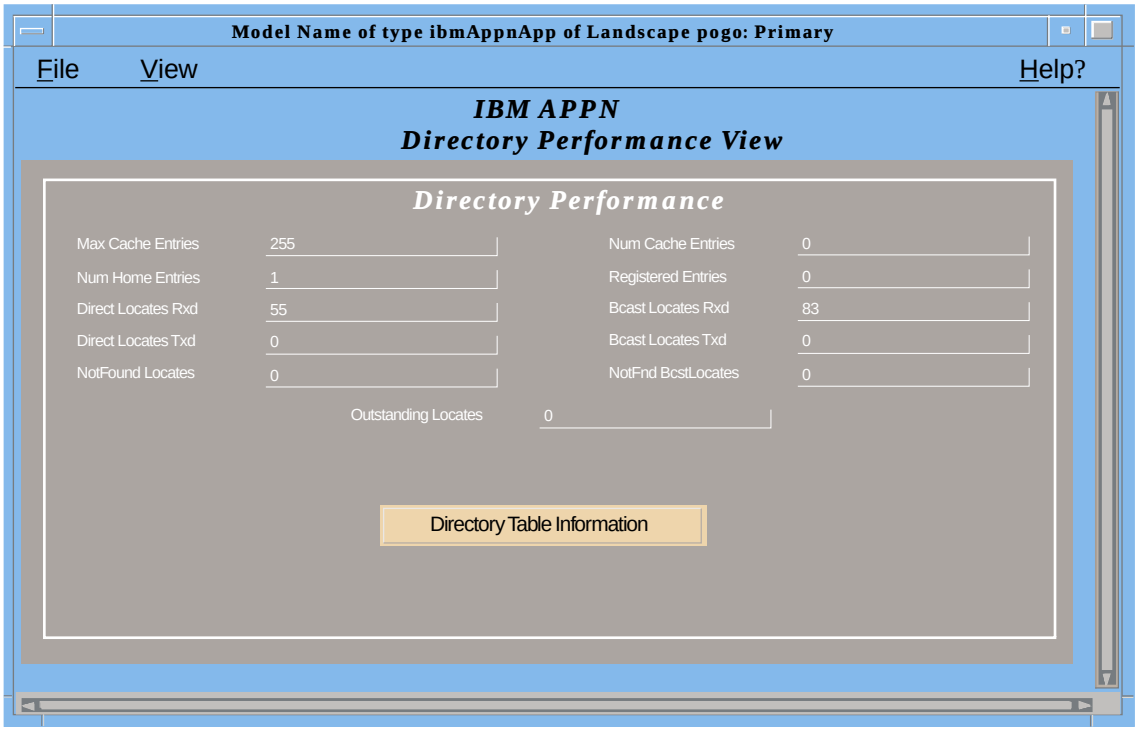
Class of Service Transmission Group Row View (Continued)

MinSecurity	The minimum acceptable security for this Class of Service: 1 NonSecure 32 PublicSwitchedNetwork 64 UndergroundCable 96 SecureConduit 128 GuardedConduit 160 Encrypted 192 GuardedRadiation
MaxSecurity	The maximum acceptable security for this Class of Service: 1 NonSecure 32 PublicSwitchedNetwork 64 UndergroundCable 96 SecureConduit 128 GuardedConduit 160 Encrypted 192 GuardedRadiation
MinDelay	The minimum acceptable propagation delay for this Class of Service in microseconds. The amount of time that it takes the signal to travel the length of the logical link. The most common values are represented as follows: 0 Minimum 384 Negligible 9216 Terrestrial 147456 Packet 294912 Long 2013265920 Maximum

Class of Service Transmission Group Row View (Continued)

MaxDelay	The maximum acceptable propagation delay for this Class of Service in microseconds. The relative amount of time that it takes the signal to travel the length of the logical link. The most common values are represented as follows: 0 Minimum 384 Negligible 9216 Terrestrial 147456 Packet 294912 Long 2013265920 Maximum
MinUsr1/2/3	The minimum acceptable value for this user-defined characteristic (0 through 255).
MaxUsr1/2/3	The maximum acceptable value for this user-defined characteristic (0 through 255).

Figure 9-4. APPN Directory Performance View



Directory Performance View

To access: Select **Directory Info** from the Icon Subviews menu. This view contains several fields and one button leading to the Directory View. Each APPN network node maintains directories containing information about which LUs (applications) are available and where they are located. LUs can be located within an APPN network node or in any of the attached end nodes.

Max Cache Entries	The maximum number of cache entries allowed. This is an administratively assigned value.
Num Cache Entries	The number of current cache entries.
Num Home Entries	The number of home entries.

Directory Performance View (Continued)

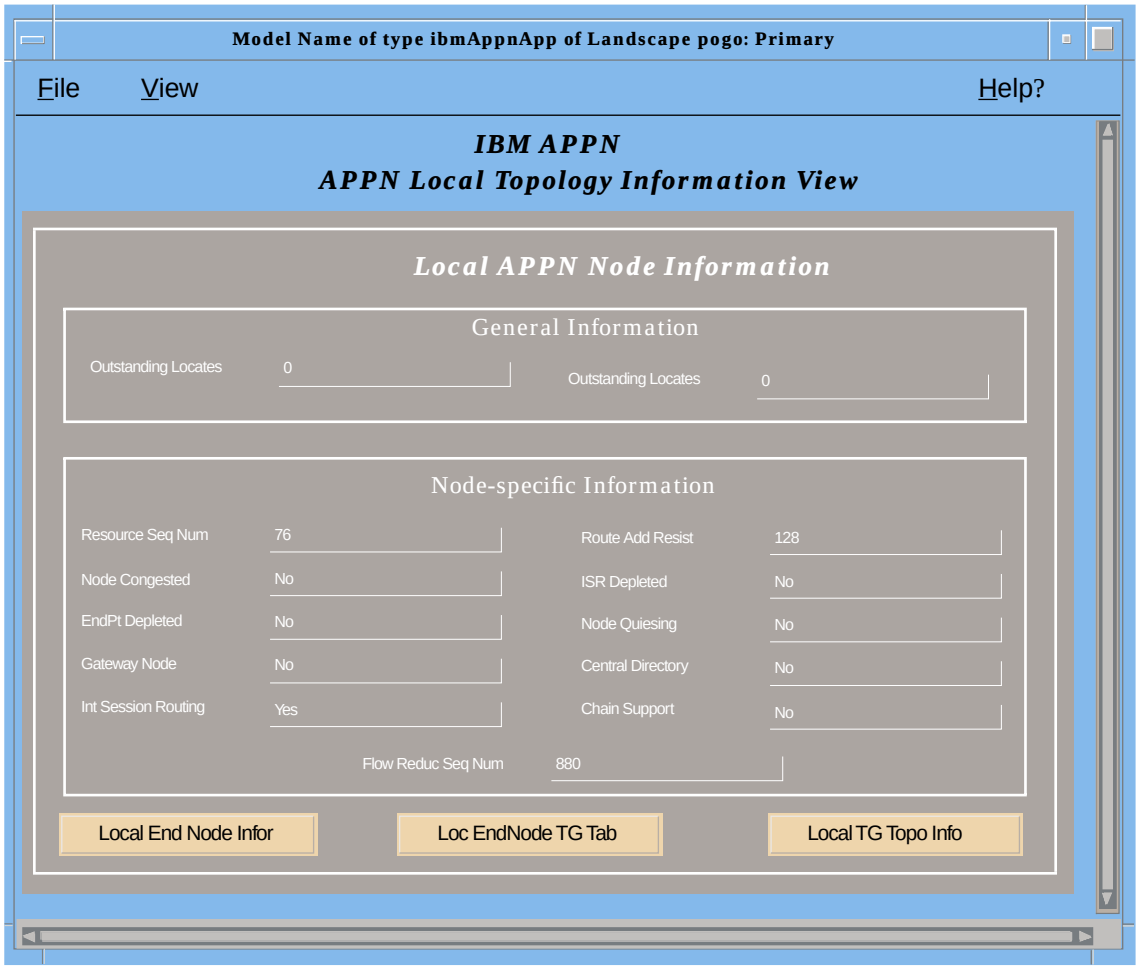
Registered Entries	The number of registered entries.
Direct Locates Rxd	The number of directed locates received.
Bcast Locates Rxd	The number of broadcast locates received.
Direct Locates Txd	The number of directed locates sent.
Bcast Locates Txd	The number of broadcast locates sent.
Not Found Locates	The number of directed locates returned with a “not found”.
NotFnd BcastLocates	The number of broadcast locates returned with a “not found”.
Outstanding Locates	The current number of outstanding locates (both directed and broadcast). A value of zero indicates that no locates are unanswered.
Directory Table Info	Clicking on the Directory Table Information button displays the Directory View.

Directory View

To access: Click the **Directory Table Information** button in the Directory Performance View. The Directory View contains information about all known LUs (applications) and TPs.

LU Name	The fully-qualified network application name in the domain of the serving network node. Also the index for the table.	
ServerName	The fully-qualified control point (CP) name of the network node server. For unassociated end node entries, the end node fully-qualified name is shown.	
OwnerName	The fully-qualified control point (CP) name of the node at which the LU is located. This name is the same as the serving network node name when the LU is located at a network node or an unassociated end node. It is also the same as the fully-qualified LU Name when this is the control point LU for this node.	
Location	The location of the LU; Local, Domain or Xdomain.	
DirType	The directory type:	
	Home	The LU is in the domain of the local network node and the LU information has been configured at the local node.
	Cache	The LU has been located by a broadcast search and the location information has been saved.
	Registered	The LU is at an end node that is in the domain of the local network node. Registered entries are registered by the served end node.
WildCard	The wildcard that will be used to locate this LU:	
	Other	Unknown type of LU entry.
	ExplicitEntry	The full LU name will be used for locating this LU.
	PartialWildcard	Only the non-blank portions of the LU name will be used for locating this LU.
	FullWildcard	All LU names will be directed to this LU.

Figure 9-5. APPN Local Topology Information View



APPN Local Topology Information View

To access: Select the **Local Topology** button from the Icon Subviews menu. This view contains two tables and three buttons leading to other views. In addition to the network topology database, each network node contains information on local TGs of the APPN network node itself. This is stored locally (in the local topology database) and not sent to adjacent network nodes.

APPN Local Topology Information View (Continued)

General Information	Information in this table applies whether the node is a network node or an end node.
Local Node Name	The administratively assigned fully-qualified name for this node in the format NETID.CPNAME.
Local Node Type	The type of APPN node; NetworkNode, EndNode or Len.
Node-Specific Information	This table only applies to network nodes.
Resource Seq Num	The Resource Sequence Number for this node. This value is assigned and controlled by the network node that owns this resource, and is an even unsigned number unless an error has occurred.
Route Add Resist	Route addition resistance indicates the relative desirability of using this node for intermediate session traffic. The value in this field (0 through 255) is used in route computation. The lower the number, the more desirable the node.
Node Congested	Indicates whether this node is congested (Yes) or not. When congestion exists, this node is not included in route selection by other nodes.
ISR Depleted	Indicates whether ISR (Intermediate Session Routing) resources are depleted. When depleted (Yes), this node is not included in route selection by other nodes.
EndPt Deplete	Indicates whether session End Point resources are depleted (Yes) or not.
Node Quiescing	Indicates whether the node is quiescing (dormant) or not.
Gateway Node	Indicates whether the node is a gateway.
Central Directory	Indicates whether the node acts as a central directory.
Int Sess Routing	Indicates whether the node supports Intermediate Session Routing (ISR).

APPN Local Topology Information View (Continued)

Chain Support	Indicates whether the node supports chaining.
Flow Reduc Seq Num	A TDU can be associated with multiple APPN resources and FRSNs are associated with TDUs. This field shows the FRSN that indicates the last time this resource was updated at this node. (FRSNs are unique only within each APPN network node.)
Local End Node	Clicking on the Local End Node Info button displays the Local End Node View described later in this section.
Loc EndNode TG Tab	Clicking on the Local EN TG Topo Nd button displays the Local End Node Transmission Group Topology Node View described later in this section.
Local TG Topo Info	Clicking on the Local TG Topo Info button displays the Local Transmission Group Topology Node View described later in this section.

Local End Node View

To access:	Click on the **Local End Node Info** button in the APPN Local Topology Information View. This view only applies to network nodes and describes all the end nodes known to this network node.
EndNodeName	The administratively assigned fully-qualified name for this end node in the format NETID.CPNAME.
TimeLeft	The number of days left before this end node entry will be deleted (0 through 31).
End Node Type	The type of APPN node; EndNode or LEN.

Local End Node Transmission Group Node View

To access:	Click on the **Local EN TG Topo Nd** button in the APPN Local Topology Information View. This view describes the Transmission Groups owned by the end nodes known to this node. (Each entry occupies three lines; the table index, the EnTgOrigin, EnTgDestination and TgNumber are repeated on each line.)
EnTgOrigin	An administratively assigned fully-qualified network name for the origin node for this TG.
EnTgDestination	An administratively assigned fully-qualified network name for the destination node for this TG. This can be a virtual node, network node, LEN or an end node.
EnTgNum	A number associated with this transmission group.

Local End Node Transmission Group Node View (Continued)

TimeLeft	The number of days remaining before this end node TG entry will be deleted.
TgDstVirt	Whether the destination node is a virtual node (Yes) or not.
TgDlcData	This field contains DLC specific data, related to the link connection network; TokenRing (MAC/SAP), X.25, X.21 or CircuitSwtch.
TgOptnl	Whether the transmission group is operational.
TgCpCpSess	Whether CP-CP sessions are supported on this TG.
TgEffectCapa	The effective capacity (an integer) in kilo bits pr second. This value is derived from the link bandwidth and the maximum load factor and has a range from 0 through 603,979,776.
TgConnCost	The cost per connection time (0 through 255). This value represents the relative cost per unit time of using the TG. A value of 0 indicates no cost; 255 is the maximum cost.
TgByteCost	The relative cost of transmitting one byte over this link from 0 (lowest cost) through 255 (maximum cost).
TgSecurity	The security is represented as an integer with a range of 1 through 255. This is an administratively assigned value associated with this TG. The most common values are represented as follows: 1 NonSecure 32 PublicSwitchedNetwork 64 UndergroundCable 96 SecureConduit 128 GuardedConduit 160 Encrypted 192 GuardedRadiation

Local End Node Transmission Group Node View (Continued)

TgDelay	The amount of time, in microseconds, that it takes the signal to travel the length of the logical link. This is an administratively assigned value associated with this TG. The most common values are represented as follows: 0 Minimum 384 Negligible 9216 Terrestrial 147456 Packet 294912 Long 2013265920 Maximum
ModemClass	This field allows multiple images for a connection network. If this entry is for a connection network, this field has the same value as in the TG vector. For non-connection networks, it is zero.
TgUsr1/2/3	First/second/third user-defined TG characteristic for this TG (0 through 255). This is an administratively assigned value associated with this TG.

Local Transmission Group Topology

To access: Click on the **Local TG Topo Info** button in the APPN Local Topology Information View. This view describes the Transmission Groups owned by the node. (Each entry occupies two lines; the table index, the TgDestination and TgNumber are repeated on the second line.)

TgDestination	An administratively assigned fully-qualified network name for the destination node for this TG. This can be a virtual node, network node, LEN or an end node.
TgNumber	A number associated with this transmission group (0 through 255).

Local Transmission Group Topology (Continued)

TgDstVirt	Whether the destination node is a virtual node (Yes) or not.
TgDlcData	This field contains DLC specific data, related to the link connection network; TokenRing (MAC/SAP), X.25, X.21 or CircuitSwtch.
TgRSN	The current owning node's RSN (Resource Sequence Number) for this resource. This is always an even unsigned number unless an error has occurred.
TgQuiescing	Whether the transmission group is quiescing (dormant).
TgOptnl	Whether the transmission group is operational.
TgCpCpSess	Whether CP-CP sessions are supported on this TG.
TgEffectCapa	The effective capacity (an integer) in kilo bits pr second. This value is derived from the link bandwidth and the maximum load factor and has a range from 0 through 603,979,776. (This is an administratively assigned value associated with this TG.)
TgConnCost	The cost per connection time (0 through 255). This value represents the relative cost per unit time of using the TG. A value of 0 indicates no cost; 255 is the maximum cost. (This is an administratively assigned value associated with this TG.)
TgByteCost	The relative cost of transmitting one byte over this link from 0 (lowest cost) through 255 (maximum cost). (This is an administratively assigned value associated with this TG.)

Local Transmission Group Topology (Continued)

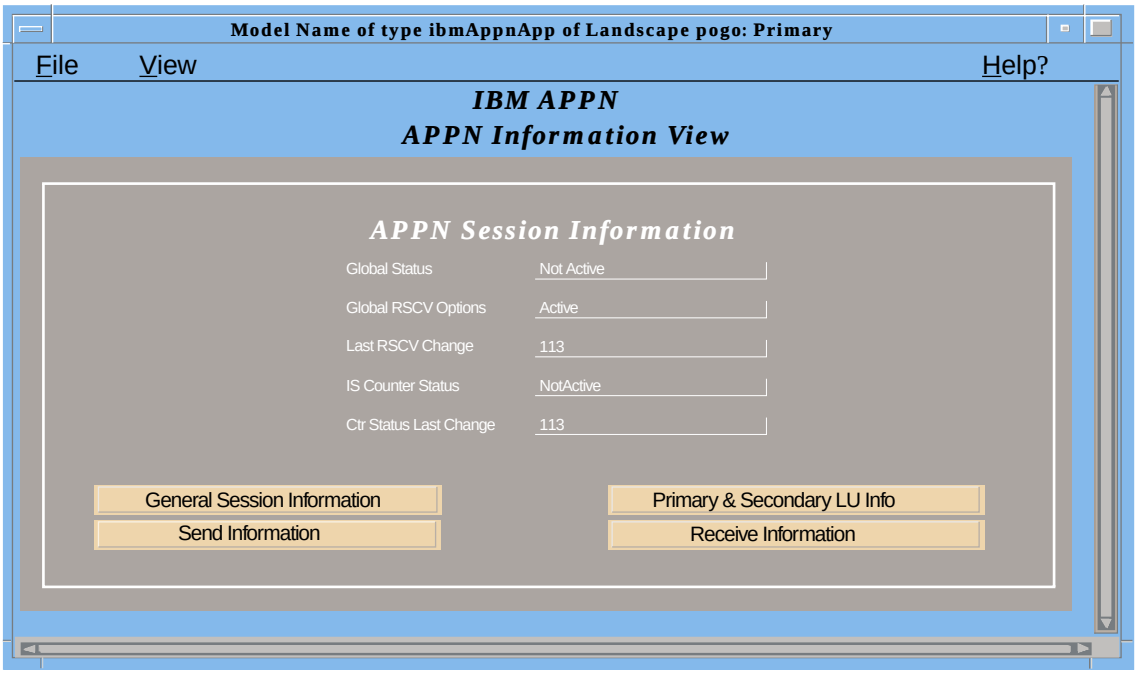
TgSecurity	The security is represented as an integer with a range of 1 through 255. This is an administratively assigned value associated with this TG. The most common values are represented as follows: 1 NonSecure 32 PublicSwitchedNetwork 64 UndergroundCable 96 SecureConduit 128 GuardedConduit 160 Encrypted 192 GuardedRadiation
TgDelay	The amount of time, in microseconds, that it takes the signal to travel the length of the logical link. This is an administratively assigned value associated with this TG. The most common values are represented as follows: 0 Minimum 384 Negligible 9216 Terrestrial 147456 Packet 294912 Long 2013265920 Maximum
TgModemClass	This field allows multiple images for a connection network. If this entry is for a connection network, this field has the same value as in the TG vector. For non-connection networks, it is zero.
TgUsr1/2/3	First/second/third user-defined TG characteristic for this TG (0 through 255). This is an administratively assigned value associated with this TG.

APPN Session Views

There is one application-specific subview for the APPN Session application from the AppnSessApp Icon Subviews menu, the APPN Session Information View. This view contains five fields and four buttons that open further views.

The APPN Session Information View is shown in Figure 9-6.

Figure 9-6. APPN Session Information View



APPN Session Information View

To access: Select **Configuration** from the Icon Subviews menu. This opens the APPN Session Information View, which contains several fields and four buttons. These are described below.

Global Status	Indicates the current collection options in effect. Possible states are: notActive - collection of counters and some names are not active. active - collection of counters and some names is active.
Global RSCV Options	Indicates the current collection options in effect. Possible states are: notActive - collection of route selection control vectors is not active. active - collection of route selection control vectors is active.
Last RSCV Change	The time when the ibmappnIsInGlobeRscv object last changed. This time is in hundredths of a second.
IS Counter Status	Indicates whether or not the intermediate session counters are active. This object reflects the combination of theibmappnIsInGlobeStatus object and the ibmappnIsAcBtypeActive object. Possible values are: notActive - collection of counters and some names is not active. active - collection of counters and some names is active.
Ctr Status Last Change	The time when the ibmappnIsInGlobeCtrStatus object last changed. This time is in hundredths of a second.
General Session Info	Clicking on this button opens the APPN Session Information View, which contains the following fields as described below.
FqLuName	The network-qualified CP name or PU name of the node at which the session and cid originated. For APPNand LEN nodes, this is either the CP name of the APPN node at which the origin LU is located or the CP name of the NN serving the LEN node at which the origin LU is located. This field is from 3 to 17 characters in length, including a period (.) which separates the NetId from the NAU name.

APPN Session Information View (Continued)

ProCorrID	The procedure correlation identifier (pcid) of a session. It is an 8-octet value assigned by the primary LU.
PriLuName	The primary LU name of the session.
SecLuName	The secondary LU name of the session.
InModeName	The Mode Name name used for this session. This is a 1-8 character name.
COSName	The Class of Service (COS) name used for this session. This is a 1-8 character name.
TxPriority	The transmission priority of this session.
IntSessType	The type of intermediate session.
IntSessState	Indicates the state of the session. Possible states are: • session is pending inactive • session is pending active • session is active • session is inactive Existing sessions can be deactivated by setting this object to inactive.
SessStartTime	Time when the session started in hundredths of a second.
SessUpTime	Length of time the session has been active in hundredths of a second.
InCntrUpTime	Length of time the session counters have been active in hundredths of a second.
PsAdjCpName	The primary stage adjacent CP name of this session.
PsAdjTgNum	The primary stage adjacent transmission group (TG) number associated with this session.

APPN Session Information View (Continued)

SsAdjCpName	The secondary stage adjacent CP name of this session.
SsAdjTgNum	The secondary stage adjacent transmission group (TG) number associated with this session.
InRouteInfo	The route selection control vector (RSCV x'2B') used for this session. It is present for APPN nodes; but is not present for LEN nodes. The format of this vector is described in SNA Formats.
Primary & Secondary LU Info	Clicking on this button opens the APPN Primary and Secondary LU Info view, which contains the PriSec LU Table and the following fields as described below.
FqLuName	The network-qualified CP name or PU name of the node at which the session and cid originated. For APPN and LEN nodes, this is either CP name of the APPN node at which the origin LU is located or the CP name of the NN serving the LEN node at which the origin LU is located. This field is from 3 to 17 characters in length, including a period (.) which separates the NetId from the NAU name.
ProCorrID	The procedure correlation identifier (pcid) of a session. It is an 8-octet value assigned by the primary LU.
PriLuName	The primary LU name of the session.
SecLuName	The secondary LU name of the session.
P2SFmdPius	The number of FMD PIUs sent from the Primary LU to the Secondary LU.
S2PFmdPius	The number of FMD PIUs sent from the Secondary LU to the Primary LU.
P2SNonFmdPius	The number of non-FMD PIUs sent from the Primary LU to the Secondary LU.
S2PNonFmdPius	The number of non-FMD PIUs sent from the Secondary LU to the Primary LU.
P2SFmdBytes	The number of FMD Bytes sent from the Primary LU to the Secondary LU.

APPN Session Information View (Continued)

S2PFmdBytes	The number of FMD Bytes sent from the Secondary LU to the Primary LU.
P2SNonFmdBytes	The number of non-FMD Bytes sent from the Primary LU to the Secondary LU.
S2PNonFmdBytes	The number of non-FMD Bytes sent from the Secondary LU to the Primary LU.
Send Information	Clicking this button opens the APPN Session Tx View, which contains the Send Session Table and the fields described below.
FqLuName	The network-qualified CP name or PU name of the node at which the session and cid originated. For APPN and LEN nodes, this is either CP name of the APPN node at which the origin LU is located or the CP name of the NN serving the LEN node at which the origin LU is located. This field is from 3 to 17 characters in length, including a period (.) which separates the NetId from the NAU name.
ProCorrID	The procedure correlation identifier (pcid) of a session. It is an 8-octet value assigned by the primary LU.
PsSendMaxBtuSz	The primary stage maximum basic transmission size (BTU) for sending data.
PsSendPacingType	The primary stage type of pacing being used for sending data.
PsSendRpc	The secondary stage send residual pace count. This represents the secondary stage number of MU's that can still be sent in the current session window.
PsSendNxWinSz	The secondary stage size of the next window which will be used to send data.
SsSndMaxBtuSz	The secondary stage maximum basic transmission size (BTU) for sending data.
SsSendPaceType	The secondary stage type of pacing being used for sending data.
SsSendRpc	The secondary stage send residual pace count. This represents the secondary stage number of MU's that can still be sent in the current session window.

APPN Session Information View (Continued)

SsSndNxWinSz	The secondary stage size of the next window which will be used to send data.
Receive Information	Clicking on this button opens the Session Rx View, which contains the Receive Session Table and the fields described below.
FqLuName	The network-qualified CP name or PU name of the node at which the session and cid originated. For APPN and LEN nodes, this is either CP name of the APPN node at which the origin LU is located or the CP name of the NN serving the LEN node at which the origin LU is located. This field is from 3 to 17 characters in length, including a period (.) which separates the NetId from the NAU name.
ProCorrID	The procedure correlation identifier (pcid) of a session. It is an 8-octet value assigned by the primary LU.
PsRxPacingType	The primary stage type of pacing being used for receiving data.
InPsRecvRpc	The primary stage type of pacing being used for receiving data.
PsRxNxWinSz	The primary stage size of the next window which will be used to receive data.
SsRxPaceType	The secondary stage type of pacing being used for receiving data.
InSsRecvRpc	The secondary stage send residual pace count. This represents the secondary stage number of MU's that can still be received in the current session window.
SsRxNxWinSz	The secondary stage size of the next window that will be used to receive data.

Chapter 10

ATM Client Application

The ATM Client Application allows you to monitor virtual channel links and change channel statistics. This chapter describes the views and subviews available for the application.

The ATM (Asynchronous Transfer Mode) Client Application provides detailed information about this ATM Client application's virtual channels.

ATM Client Application Views

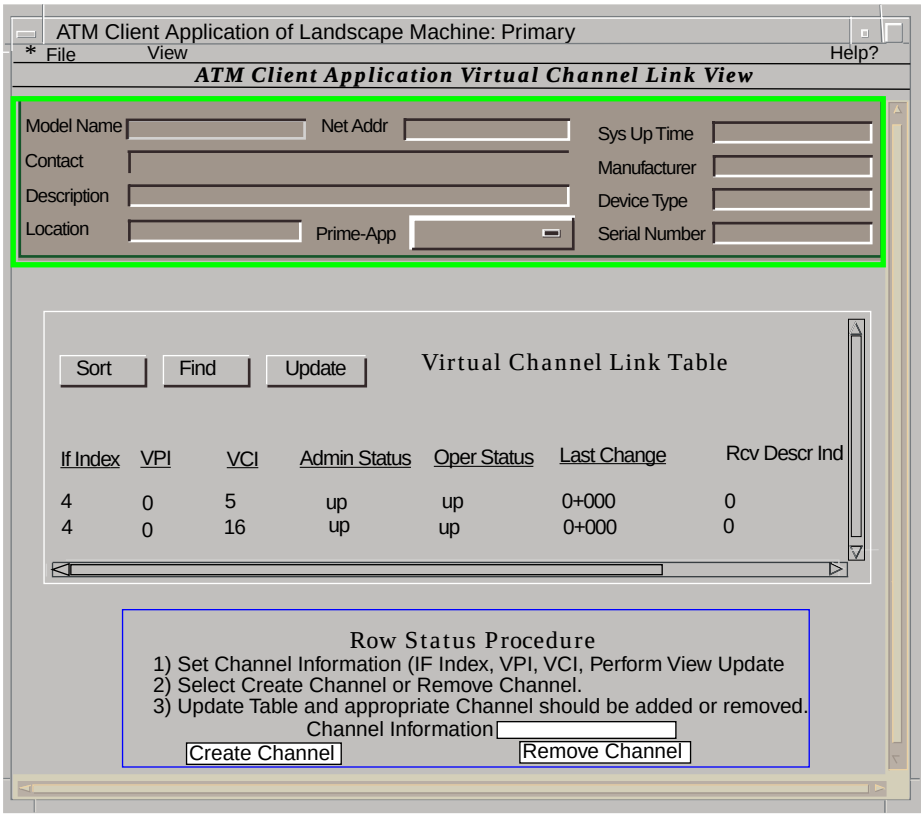
The ATM Client Application Virtual Channel Link view shows the Virtual Channel Link table. Within this view, you can create or remove virtual channel information. Another subview accessible from this view is the ATM Switch Application Virtual Channel Link view. This view allows you to change settings that control how virtual channel statistics are displayed. The model type name for the ATM Client application is ATM_Client App.

Refer to Table 10-1 for icon subview access information to the application-specific views. Figure 10-1 shows the ATM Client Application Virtual Channel Link view.

Table 10-1. ATM Client Application Views

Icon Subviews Menu Choice	View Accessed	Information Provided
ATMConfig	AToM MIB	For more information, refer to the SPMA guide for the device you are monitoring.
ATM Lec Config	ATM Administrator	For more information, refer to the ***SPMA Modules Guide***.
VCL Table	ATM Client Application Virtual Channel Link	Refer to *Virtual Channel Link Table View*, on page 10-4.
Interfaces-> CSIIIfPort -> Performance	Port Configuration - CSIIIfPort	Refer to Chapter 3, *Configuration Views*, for the device you are monitoring.
Interfaces -> CSIIIfPort -> Configuration	Performance - CSIIIfPort	For more information, refer to **Performance** under SPECTRUM Administration.

Figure 10-1. ATM Client Virtual Channel Link View



Virtual Channel Link Table View

You can update, sort, or search the table for specific information. Double-clicking a column entry accesses the interface-specific ATM Switch Application Virtual Channel Link view, in which you can modify some field values.

To access:	Select **VCL Table** from the **Icon Subviews** menu with the highlighted ATM_Client App icon.
IF Index	Displays the interface index for this Virtual Channel link.
VPI	Displays the Virtual Path Identifier value of the VCL. The maximum VPI value cannot exceed the value allowable by the Interface MaxVPI Bits.
VCI	Displays the Virtual Channel Identifier value of the VCL. The maximum VCI value cannot exceed the value allowable by the Interface MaxVCI Bits.
Admin Status	This field is implemented only for a VCL that terminates a VCC (i.e., one that is not cross-connected to other VCLs). Its value ("Up" or "Down") specifies the desired administrative state of the VCL, i.e., whether traffic flow is enabled or disabled for this VCL.
Oper Status	This field indicates the current operational status of the VCL. "Up" and "Down" indicate that the VCL is operational or not operational, respectively. "Unknown" indicates that the status of this VCL cannot be determined.
Last Change	The value of sysUpTime at the time this VCL entered its current operational state. If the current state was entered prior to the last re-initialization of the agent, then this field contains a zero value.
Rcv Descr. Index	The value of this field identifies the row in the ATM Traffic Descriptor Table that applies to the receive traffic direction of this VCL.

Virtual Channel Link Table View (Continued)

Xmit Desc. Index	The value of this field identifies the row of the ATM Traffic Descriptor Table that applies to the transmit traffic direction of this VCL.
AAL Type	An instance of this field only exists when the local VCL endpoint is also the VCC endpoint, and AAL (ATM Adaptation Layer) is in use. The field indicates the type of AAL used on this VCC, which includes AAL1, AAL3/4, and AAL5. The “other” type is a user-defined AAL type. The “unknown” type indicates that the AAL type cannot be determined.
Transmit Size	An instance of this field only exists when the local VCL endpoint is also the VCC endpoint, and AAL5 is in use. The field indicates the maximum AAL5 CPCS SDU size, in octets, that is supported on the transmit direction of this VCC.
Receive Size	An instance of this field only exists when the local VCL endpoint is also the VCC endpoint, and AAL5 is in use. The field indicates the maximum AAL5 CPCS SDU size, in octets, that is supported on the receive direction of this VCC.
Encaps Type	An instance of this field only exists when the local VCL endpoint is also the VCC endpoint, and AAL5 is in use. The field indicates the type of data encapsulation used over the AAL5 SSCS layer. The definitions reference RFC 1483 Multiprotocol Encapsulation over ATM AAL5 and ATM Forum LAN Emulation specification.
Cross Connect Id	This field is implemented only for a VCL that is cross-connected to other VCLs that belong to the same VCC. All such associated VCLs have the same value of this field, and all their cross-connections are identified by entries in the Cross Connect Table for which VCL CC Id has the same value. The value of this field is initialized by the agent after the associated entries in the Cross Connect Table have been created.

Virtual Channel Link Table View (Continued)

Row Status	To create a new VCL, this field is initially set to "createAndWait" or "createAndGo." This field must not be set to "active" unless the following columnar fields exist in this row: • RTD Index • XTD Index • AAL Type (if the local VCL endpoint is also the VCC endpoint) • Transmit Size (for AAL5 connections only) • Receive Size (for AAL5 connections only) • Encaps Type (for AAL5 connections only)
Row Status Procedure	This panel lets you create rows in the Virtual Channel Link table. Follow these steps: 1. In the Channel Information field, enter the channel information for the row you wish to create. For example, 4.0.5 represents the IF Index, VPI, and VCI fields of the first row in Figure 10-1. 2. Under File, select **Save All Changes**, and click the **Create Channel** button. If the Invalid Row Status Information dialog appears, re-enter the appropriate data. To remove a row: 1. In the Channel Information field, enter the IF Index, VPI, and VCI channel information for the row you wish to remove. 2. Select **File** > **Save All Changes**, and click the **Remove Channel** button. 3. Update the table; the row now disappears from the table view.

Chapter 11

Fast Ethernet Application

The Fast Ethernet application allows you to configure Fast Ethernet ports for high performance Fast Ethernet switching modules. This chapter describes the views and subviews available for the Fast Ethernet Application.

You can use the Fast Ethernet application to determine if the Ethernet uplink between the device and a given port is 10Base or 100Base. You can then use the application to configure the interface for auto-negotiation by default, or manually set its operational mode to a particular 10Base or 100Base setting.

A port set to the value of Auto-Negotiation forces the operational mode to be set automatically depending on the speeds and modes supported by the attached device. Any other setting with Auto-Negotiation included, results in an error, since an operational mode and auto-negotiation cannot be forced at the same time. During link re-negotiation, a temporary link loss exists.

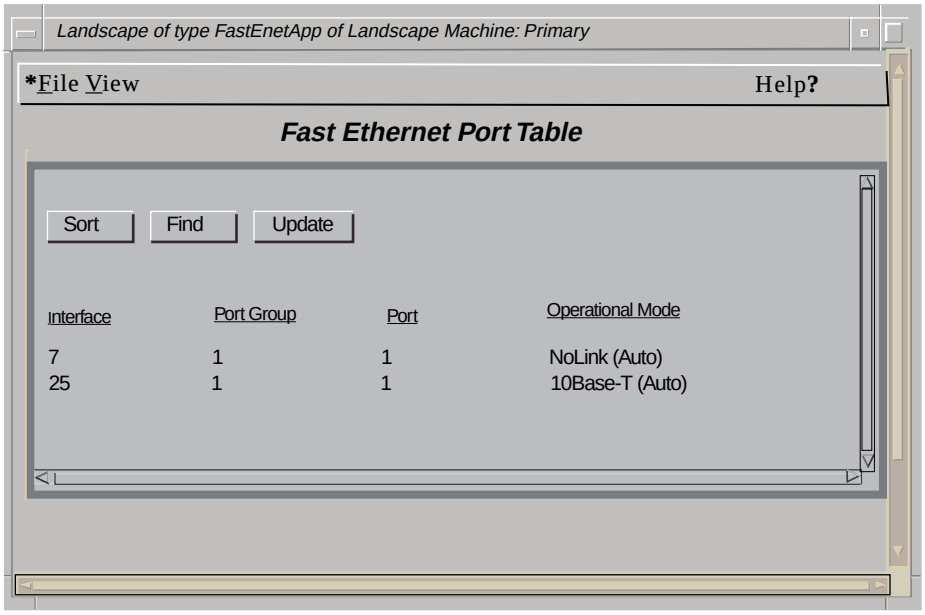
Manually set operational modes stay in effect until device reset or powerdown. At that time the mode reverts to its default.

Fast Ethernet Application Views

The Fast Ethernet application provides one device-specific view: the Fast Ethernet Port Table view. To access this view, click **Control Table** in the **Icon Subviews** menu. The Fast Ethernet Port Table provides a list of definitions and control objects over the 100Base-X ports. The model type name for the application is FastEnetApp.

Figure 11-1 shows the Fast Ethernet Port Table view.

Figure 11-1. Fast Ethernet Port Table View



Fast Ethernet Port Table View

You can update this table, and sort or search the table for specific port information. The SPMA Port Configuration window is accessed by double-clicking any table entry. For more information on the SPMA Port Configuration window, refer to the SPMA guide for the device you are monitoring.

To access: Select **Control Table** from the Icon Subviews menu.

Interface	Identifies a particular interface for the indicated port.
Port Group	The port group to which the indicated port belongs.
Port	The physical port number for which the Fast Ethernet information applies.

(Continued)Fast Ethernet Port Table View

Operational Mode	The current (Ethernet or Fast Ethernet) operational mode of this port. The mode values are listed below. **NoLink** indicates no uplink exists **Unknown** indicates the uplink status is unknown, or the uplink is initializing **10Base-T** indicates 10Base-T **10Base-TFD** indicates Full Duplex 10Base-T **100Base-TX** indicates 100Base-TX **100Base-TXFD** indicates Full Duplex 100Base-TX **100BaseT4** indicates 100Base-T4 **100Base-FX** indicates 100Base-FX **100Base-FXFD** indicates Full Duplex 100Base-FX **(Auto)** indicates Auto-Negotiation is enabled for this port connection, and can appear with any setting. If Auto does not appear in the last column, auto-negotiation is disabled and the port's Ethernet operational mode is configured manually.

Index

Numerics

100Base-FX 11-3
100Base-FXFD 11-3
100BaseT4 11-3
100Base-TX 11-3
100Base-TXFD 11-3
10Base-T 11-3
10Base-TFD 11-3

A

A/C 7-2
Abort Trans 7-3
Aborted Frames 4-7
ACC Map 2-6
Active Monitor Process 7-4
Active Port 5-3
Advanced Peer-to-Peer Networking 9-1
AMI 3-4
APPN 9-1
APPN Application 9-1
APPN Session Views 9-57
APPN Views 9-1
- Adjacent Node View 9-31
- APPN Global Topology View 9-25
- APPN Information View 9-3
- APPN Local Topology Information View 9-49
- Class of Service Mode View 9-41
- Class of Service Name View 9-41
- Class of Service Node Row View 9-42
- Class of Service Tables View 9-40
- Class of Service Transmission Group Row View 9-43
- Directory Performance View 9-46
- Directory View 9-48
- End Node View 9-6
- Flow Reduction Sequence Number Topology Node View 9-36
- Link Station & Port Information View 9-9

A (continued)

APPN Views
- Local End Node Transmission Group Node View 9-52
- Local End Node View 9-52
- Local Transmission Group Topology 9-54
- Memory & XID Information View 9-7
- Network Node View 9-5
- Node Link Station DLS View 9-21
- Node Link Station IP View 9-20
- Node Link Station Token Ring View 9-22
- Node Link Station View 9-15
- Node Port DLS View 9-12
- Node Port IP View 9-12
- Node Port Token Ring View 9-13
- Node Port View 9-10
- Node Topology Tables View 9-29
- SNMP Information View 9-6
- Topology Node View 9-32
- Topology Route View 9-30
- Transmission Group FRSN Topology Node View 9-37
- Transmission Group Topology Node View 9-33

Asynchronous Control Character (ACC) Map 2-8
asynchronous link 4-1
Asynchronous Transfer Mode 5-1
ATM Client 10-1
ATM Config 10-2
ATM Lec Config 10-2
ATM Switch Application Virtual Channel Link view 10-1
ATM_Client App 10-1
AToM MIB 10-2
Auto 11-3
AutoBaud 4-9
Auto-Negotiation 11-1
Auto-RemovalError 7-5

B

B8ZS 3-4
Bad Addresses 2-10
Bad Controls 2-10
Bad FCSs 2-10
Bandwidth 3-7
BitOriented 3-5
Burst 7-2

C

C_wrap_a 1-7
C_wrap_b 1-7
C_wrap_s 1-8
CF State 1-7
Challenge Handshake Authentication Protocol (CHAP) 2-1
Changes 4-5
Channel Number 3-7
Character MIB 4-1
Check 1-7
Circuit
  Number 6-2, 6-6
Clear To Send 4-5
Clear to Send 4-3
ClockSrc 4-7
Close 7-4
Commands 7-4
Compression 5-4
Concatenated 1-10
Configuration Management 1-1
Congestion 6-3, 6-7
Congestions 7-2
Connect 1-9
Connection Management 1-1
Control Protocols 2-1
Control Table 11-1
CRC Length 5-4
CSIIfPort > Configuration 10-2
CSIIIfPort 10-2
CtWANApp 5-1
CtWANApp Icon 5-1
CtWANAppDS1 3-1
CtWANAppRS232 4-1

D

data 4-1
Data Bits 4-9
data circuit-terminating 4-1
Data Set Ready 4-3, 4-5
data terminal equipment 4-1
DCE 4-1
Deinsert 1-7
Detect 1-11
Digital Signal 1 3-1
Directed 1-11
Disable-a 1-9
Disable-b 1-9
Disable-m 1-9
Disconnect 1-9
DLSw Application 8-1
DLSw Views 8-1
  Circuit Data Transfer View 8-12
  Circuit Diagnostic View 8-9
  DLS Participating Routers View 8-4
  Information View 8-2
  Local NetBOIS Filter View 8-7
  Local SNA Frame Filter View 8-6
  NetBOIS Default Destination View 8-9
  Poll and Status View 8-10
  Remote NetBOIS Filter View 8-8
  Remote SNA Frame Filter View 8-7
  SNA Default Destination View 8-8
  Station View 8-4
Double Click For 5-3
Downstream Port Type 1-10
DS1
  Views 3-1
    Configuration 3-3
    Configuration Table 3-2
    Fractional Table 3-7
DS1 Application 3-1
DS1 Identifier 3-4
DTE 4-1
Dup Address 1-12

E

Early token release 7-1
Entry Index 5-4
Error Breakdown 4-7, 4-10
Errors 1-10
Ethernet 1-1
Ethernet uplink 11-1

F

Fast Ethernet application 11-1
Fast Ethernet Port Table view 11-1
Fast Ethernet switching modules 11-1
FastEnetApp 11-1
Fault Isolation and Recovery 1-1
FCS Size 2-6, 2-8
FDDI App 1-2
FDDI App Views 1-4
FDDI Application 1-1
FDDI Station List View 1-2, 1-3
FddiSMT 1-2
Fiber Data Distributed Interface 1-1
Format Errors 1-10
Fractional Table 3-6
Frame Check Errors 4-7
Frame Check Sequence 2-6, 2-8
Frame Copied 7-2
Frame Relay 5-1, 6-1
    Application Views 6-1
    Circuit Detail View 6-1
Frames
    Copied 1-10
    Discarded 6-4
    Received 1-10
    Transmitted 1-10
Framing Errors 4-9, 4-10
Frequency 7-3
Full Duplex 100Base-FX 11-3
Functional Address Bitmask 7-4

G

No entries for this letter.

H

Hard Errors Breakdown 7-3
HardError 7-5
Hardware Port MIB 4-1
Hardware Present 1-12
HDB3 3-4
HDLC 2-10
HiVersionId 1-5

I

IBM 8-1, 9-1
IEEE 802.5 7-1
IF Index 2-6, 3-3, 3-7
If Index 5-4
In 1-6
In Signals 4-3
In Speed 4-3
Index 1-5, 3-3
Input Signals 4-3
Insert 1-7
Interface 3-7
Interface MIB 4-1
Internal 7-3
Interrupted Frames 4-7
Isolated 1-7, 1-9, 1-11
Isolating Soft Errors Breakdown 7-2

J

JBZS 3-4

L

LCP configuration parameters 2-4
Leave 1-7
Line 7-2
Line Build Out 3-5
Line Coding 3-4, 5-4
Line Status 3-6
Line Type 3-3
LineLoop 3-4
Link Control Protocol (LCP) 2-1
Link Quality Report (LQR) 2-1
link re-negotiation 11-1
Lobe Wire 7-3
LobeWireFault 7-5
Local 1-9, 3-4
Local MRU 2-6
Local to Remote Configuration 2-6
Local_a 1-7
Local_ab 1-7
Local_b 1-7
Local_s 1-8
Loop 3-4
Loopback Config 3-4
LoopbackState 3-6
LossOfFrame 3-6
LossOfSignal 3-6
Lost Frames 7-2
LoVersionId 1-5
Lower Layer Index 6-2, 6-6

M

MAC
- Cts 1-5
- If Index 1-9
- Index 1-9
- Path 1-9
- Table View 1-9

MAC/Canonical 1-3
Master Cts 1-6
Master Ports 1-3
Maximum Receive Unit (MRU) 2-8
modem signals 4-1
MsgOriented 3-5
MTU 5-4
Multicast 6-3, 6-6
multimode 1-1

N

NetBOIS 8-1
Network Control Protocols (NCPs) 2-2
Network Protocols 2-2
NoAlarm 3-6
Node Class 1-3
NoLink 11-3
NoLoop 3-4
Non Master Cts 1-6
None 3-5, 7-4
Non-Isolating Soft Errors Breakdown 7-2
Non-Op 1-11
Non-Op-Dup 1-11
Notify 1-6

O

Open 7-4
Operational Mode 11-2
OpVersionId 1-5
OSI Layer-3 protocol 2-2
Other 1-8, 3-4
OtherFailure 3-6
OtherLoop 3-4
Out 1-6
Out Signals 4-3
Out Speed 4-3
Output Signals 4-3
Overrun Errors 4-9, 4-10

P

Packet Too Longs 2-10
PAP 2-1
Parallel-printer-like MIB 4-1
Parity 4-9, 4-10
- Errors 4-9, 4-10

Password Authentication Protocol 2-1
Path_Test 1-7
Path-Test 1-9
PayloadLoop 3-4
Peer Wrap 1-8
Physical Index 2-6, 2-8
Physical Port 5-4
Physical Ports 5-2
Point-to-Point Protocol (PPP) 2-1
Port ID 4-5, 4-6, 4-8
Port Index 4-2, 5-3
Port Type 4-3
PPP Link Status Performance View 2-9
PPP MIB 4-1
Primary 1-10
Primary Port 5-3
Protocol 5-4
Protocol Compression 2-6

Q

No entries for this letter.

R

Rcv. Overrun Errors 4-7
RcvAIS 3-6
RcvFarEndLOF 3-6
RcvFarEndLOMF 3-6
RcvTestCode 3-6
Recoveries 7-3
Remote
- Disconnect 1-8

Remote MRU 2-8
Remove Ring Station Coun 7-2
RemoveReceived 7-5
Reset 7-4
RFC 123 3-1
RFC 1406 3-1, 5-1
RFC 1512App 1-2
Ring
- Management State 1-11

Ring Open-Status 7-4

R (continued)

Ring Scheduling 1-1
Ring Speed 7-4
Ring State 7-4
Ring Status 7-4
Ring Topology 1-3
Ring-Op 1-11
Ring-Op-Dup 1-11
RingRecovery 7-5
RobbedBit 3-5
RS232
    Views
        Asynchronous Port Detail 4-10
        Port Input Signals Table 4-4
        Port Output Signals Table 4-5
        Port Table 4-2
        Port Table Configuration 4-3
        Synchronous 4-6
        Synchronous Port Table 4-6
RS-232 Applications. 4-1
RS232 Port Table 4-2
RS-232Async 4-1
RS-232Sync 4-1

S

SDLC 8-1
Secondary 1-10
Self-Test 1-9
serial point-to-point links 2-1
Set/Clear Filter 1-3
Settings 3-7
Signal Loss 7-3
Signal Mode 3-5
Signal Name 4-5
SignalLoss 7-5
single mode 1-1
SingleStation 7-5
SMT 1-1
    Index 1-9
    Station Table 1-5
SNA 8-1, 9-1
Soft Error Count 7-2
SoftError 7-5
Sort Up/Sort Down/Un-Sort 1-3
start-of-frame sequence 7-1
State 4-5

S (continued)

Station
    Action 1-8
    Status 1-8
    Table View 1-5
Station Address 1-3
Station Connection Statistics 1-1
Station Insertion and Removal 1-1
Station Management 1-1
StatRptPolicy 1-6
Stop Bits 4-9, 4-10
Switched Multimegabit Data Service 3-1, 5-1
synchronous link 4-1
Synchronous Port Detail View 4-7
Systems Network Architecture 8-1, 9-1

T

T1 5-1
T16AIS 3-6
T3 5-1
temporary link los 11-1
There 1-2
Threshold 1-11
Thru 1-8, 1-10
Time
    Stamp 1-8
Timeslots 3-7
T-Max Value 1-10
Token 7-3
Token Ring 1-1
    Views 7-1
        Detail 7-2
        IF 7-3
        IF Configuration 7-4
Token Ring App 7-1
Token Ring Application 7-1
Token Ring IF App 7-1
token-passing 7-1
Total Connections 5-2
Trace 1-6, 1-11
TraceMaxExpiration 1-6
TransitionTimeStamp 1-8
Transmission MIB 4-1
Transmit Clock 3-4
TransmitBeacon 7-5
Transmitted Beacon Count 7-2
TVX Value 1-10
Type 5-3

U

Up Stream Neighbor 7-4
Update 1-3
Upstream Neighbor 1-3

V

VCL Table 10-2
Virtual Channel Link table 10-1
Virtual Channel Link view 10-1
virtual channel statistics 10-1
Virtual Circuit
    Address 6-6
    Mode 6-3, 6-7
    State 6-6
    Type 6-3, 6-7

W

WAN 5-1
    Views 5-1
        Connection Interface Table 5-4
        Connection Physical Ports 5-3
        Connection Table 5-1
WAN Connection 5-2, 5-4
Wide Area Network 5-1
Wrap_a 1-7
Wrap_ab 1-8
Wrap_b 1-7
Wrap_s 1-8

X

X.25 5-1
Xmt. Underrun Errors 4-7
XmtAIS 3-6
XmtFarEndLOF 3-6
XmtFarEndLOMF 3-6

Y

No entries for this letter.

Z

ZBTSI 3-4